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Creativity in Aboriginal students and the implications for language teaching

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CREATIVITY IN ABORIGINAL STUDENTS AND THE IMPLICATIONS FOR LANGUAGE TEACHING

by

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ABSTRACT

The current level of scholastic success of Aboriginal students in Western Australian schools is overviewed together with some concerns regarding Aboriginal cognition. The issues which appear to inhibit in Aboriginal children the sort of cognitive development which is beneficial for schooling, are reviewed. These are seen as cultural discontinuity, Vygotsky's belief in the cultural transmission of language, political constraints and the concept that different cultures with different needs produce different modes of thinking. Aboriginal child rearing practices are also reviewed together with the definition, process and product of creativity. The review also deals with the creative person, the creative environment, creativity and the brain, creativity and intelligence and some suggestions for the ideal classroom for fostering creativity. The results of a pilot study exploring Aboriginal creativity are outlined and the Torrance Figural A Creativity test is shown to be an inappropriate measure for Aboriginal children.

Research into Aboriginal creativity has been completed using the Test of Creative Thinking (Urban and Jellen, 1984), the Renzulli Hartman creativity scale and the Group Inventory for Finding (Creative) Talent (GIFT) Upper Elementary level (Rimm, 1976).

Some evidence supporting the argument that Aboriginal children are creatively superior to European students has been produced, but the results are inconclusive. Nevertheless the indications alone provide food for thought which could lead to a re-thinking of not only classroom management techniques but also the entire curriculum including concepts, content and strategies, which is placed before Aboriginal children.

DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

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INTRODUCTION

Introduction

From February 1980 until December 1982, the author was the Secondary Level Advisory Teacher for Aboriginal Education with the then West Australian Education Department. During this time she was constantly approached by teachers, generally of middle class European background, who were having difficulty in managing the behaviours of Aboriginal children at school.

The philosophy of the Department at that time held that children's behaviours were a direct result of family child rearing practices and that teachers must understand these and adjust their management techniques accordingly.

It was believed that Aboriginal child rearing practices had changed little in the two hundred years since European invasion and that even children born into quite urban areas were raised in a fairly similar manner to those still living in the remote enclaves of traditional culture. Thus it was believed that to a greater or lesser degree, depending on the level of European

contamination, due to proximity or intermarriage, Aboriginal children had a common heritage of child rearing practices as a result of common culture.

It should not be imagined that there is "an" Aboriginal culture. In fact it is estimated that when Captain Cook arrived in Botany Bay there were approximately 750,000 Aborigines (recent estimate) speaking many languages. Estimates vary as to exactly how many languages were spoken because the definition of what constitutes a language or a dialect differs from one linguist to another. However, Blake [1981, pp.5-6] states

> If there were 600 tribes, there must have been 600 dialects.... Allowing for the fact that the linguist has to make some arbitrary classifications in these difficult cases, it seems that a figure of between 200 and 250 [languages] is a realistic one ... [of which] about fifty are extinct.

Thus, there were many cultures (sometimes referred to as nations) and what was common practice in one culture may well have been absent from another. However, they were all hunting-gathering economies with a common origin and common needs, so there were many similarities.

In any culture the child rearing practices are developed over time to produce the type of individual necessary for the survival of the species [Kneller, 1965]. Aboriginal child rearing practices produced individuals who were ideally suited to a hunting and gathering economy. The character traits necessary for survival in this form of economy would seem to be

a high degree of early independence; initiative and decision making skills (necessary to make the most of opportunities when reference to others was impossible); patience, combined with a high degree of concentration; and creativity (necessary for making the most of any opportunity).

It is important to realise that at that time there was little in the way of educational research data to support the idea that Aboriginal children per se possessed these character traits. The belief was based on the work of anthropologists who had only studied traditional communities [Harris, 1980; Hamilton 1981], a psychologist, [Kierans, undated] and the observations of many teachers in schoolrooms all over Western Australia. There was no scientific data to support the theory that all Aboriginal children possessed these traits. Moreover it should be noted here that by 1987 the anthropological perspective, that cultural differences were the sole cause of Aboriginal children's failure at school, was being questioned because of its simplistic and one dimensional nature [Folds, 1987].

Nevertheless, in the early '80s subjective statements were made by Aboriginal Education Department staff (J. Elphick, Primary Advisor; M. O'Brien, Aboriginal Consultant; M. Jackson, Education Officer) in Teacher Workshops (1980, 1981) to the effect that if teachers took the children's character traits (i.e. independence, initiative, well developed decision making skills, patience, concentration and creativity) into consideration and modified their classroom techniques accordingly, then the problems of classroom management which impeded effective

teaching would be overcome. In practice, this did in fact remove much of the classroom conflict, but there were many other variables to be considered before sustained effective learning could occur.

It was about this time that in the writer's opinion, a general belief began to emerge among those people concerned with the improvement of Aboriginal education. It was generally felt that in certain learning areas, Aboriginal children exhibited cognitive operations or skills, which, while they differed from European children, could nevertheless be seen as positive attributes which could be exploited in the classroom to assist Aboriginal children in achieving scholastic success. One of these areas was the area defined as creativity. This view, though held by a number of people involved in the education of Aboriginal children, was not based on any empirical evidence. Thus, when the situation arose for the author to conduct research in the area of creativity, it seemed the ideal opportunity to obtain data on the levels of creativity of Aboriginal children. The cognitive operations involved in creativity are those which are essential in the constructive skills of reading and writing [Preen and Barker, 1987; Latham and Sloan, 1979]. If differences in creative thinking are evidenced then the traditional reductionist approaches to the teaching of these subjects, in schools, will need to be reassessed.

In this dissertation, the current situation with regard to Aboriginal success at school will be discussed, together with some attendant concerns regarding Aboriginal cognition. This will be followed by an examination of the available literature

and the reasons given therein for the failure of people from hunting and gathering economies to succeed in educational systems structured on European models. The differences between Aboriginal and European child rearing practices will then be examined and consideration will be given to the nature and function of creativity itself. Next an explanation is given of the research design chosen; the methodology employed and the test instruments used.

The thesis will contain a discussion of the research findings, together with an evaluation of the relative abilities of groups of Grade 5 children of both Aboriginal and European descent. Finally, the thesis will conclude with a number of assertions regarding Aboriginal children and Aboriginal education with particular reference to Reading and Writing. In addition some considerations for further work in the field of Aboriginal creativity will be outlined.

Purpose

The ultimate purpose of the research is to provide a scientific basis for the demand for changes [Hudson and Taylor, 1987; Knapp, 1981] in curriculum and management in the education of Aboriginal children.

It is anticipated that the research findings of this study will indicate that:

1. Aboriginal children are significantly more creative than their European peers.
2. The work of Aboriginal children is affected by the element of time to a significantly greater degree than that of European children.

Definition of Terms

Aborigine - Any child identifying himself/herself as being culturally an Australian Aborigine and recognised by the group as such may acceptably be termed an Aborigine, but in this study the term refers to those children whose antecedents were Aborigines and have been brought up by one or both Aboriginal parents.

Non-Aboriginal - In this instance refers to children other than Aborigines attending Western Australian schools.

European - All those children descendant of European origin. Their families may be of Anglo-Celtic, Yugoslav, Greek, Italian, Spanish, Latvian, etc, origin.

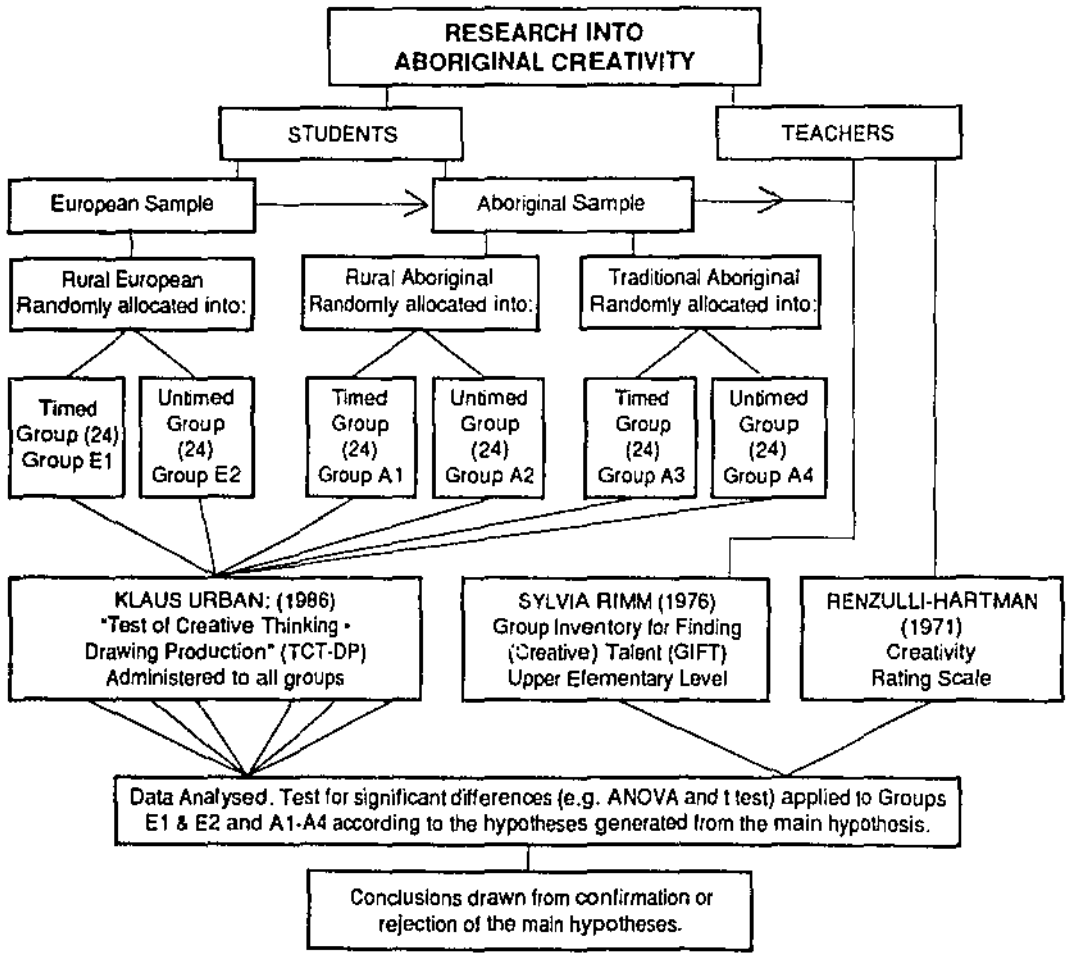
SES - Socio-economic status, i.e. standard of living achieved as a result of one's vocation and its resultant financial reward.

Traditional Aboriginal (lifestyle) - Lifestyle followed by some Aborigines in the more remote areas of Australia which is similar to that of Aboriginal people in Australia before white invasion. This is really an impossibility as evidence of contamination by the technology of the dominant culture can be found at every level of life from steel bladed knives to food handouts and the damage done to the spiritual life of the tribe by European religious influences.

Wadjala - "white" person in the language of the southwest of WA Noongah Aborigines.

Overview of Research Design

The field study method using field experiment procedures was the method best suited to testing the main hypotheses of this research [Meyers and Grossman, 1974]. The school then became the relevant environment which was "roughly natural" [ibid, p.174] and the observations of the researcher were focused specifically on child creativity and its accompanying behaviours. Several different measures of creativity have been used employing both experimental and control conditions. In other words "independent variables ... [have been] manipulated, dependent variables established and control procedures enacted in ... the subjects natural environment" [ibid, p.185]. The method has involved procedures related to the following paradigm:



Background to Study

The Current Situation

> It is an irrefutable fact that most Aboriginal children are under achieving scholastically.
>
> [Hudson and Taylor, 1987, p.3]

and

> It is an unfortunate fact that the Australian school system has found it extremely difficult to accommodate [itself] to the needs of Aboriginal children who, in most cases, leave school barely literate and numerate....
>
> [Knapp, 1981, p.161]

Knapp and Hudson and Taylor have stated the parlous state of Aboriginal education quite clearly. Unfortunately the situation has changed little in the last eight years. Table 2:1 which follows, shows data from a longitudinal study of the retention rates of the Grade I intake of 1976, from original enrolment through to the end of Year 12, clearly indicating that the school system is failing Aboriginal children.

TABLE 2:1
Enrolments in WA Government Schools showing Aboriginal and Non-Aboriginal retention rates: Profile of Grade I intake 1976

Date	*Year of School*	*No of Ab Students*	*% of Ab Students*	*No of Non-Ab Students*	*% of Non-Ab Students*
Feb 1976	Year 1	914	100.00	19,735	100.00
Feb 1986	Year 10	650	71.11	18,746	94.9
Dec 1986	Year 10 (completion)	559	61.16	18,474	93.97
Feb 1987	Year 11	239	26.14	13,887	70.37
Feb 1988	Year 12	73	7.98	11,225	56.88
Dec 1988	Year 12 (completion)	63	**6.89**	10,300	**52.23**

Figures provided by Ministry of Education, April 1989.

Due to the high mobility of Aboriginal families it is quite possible that the 914 Aboriginal children enrolled in Grade I in 1976 did not really represent 100% of the school age children at the time. Nevertheless without other statistics this figure has been accepted as such. The extent of the problem of Aboriginal schooling can be clearly seen in the retention rates of Aboriginal children as opposed to non-Aboriginal children. Of the 914 Aboriginal students who started school in Grade 1 in 1976 in Western Australia, only 650 actually entered Year 10 and 559 completed the year. There are no figures available for Year 10 graduation. However 239 Aboriginal students did enter Year 11 in 1987, although this number fell drastically to 73 Aboriginal students who started Year 12 a year later, of which only 63 completed the year.

A comparison of these figures with those for non-Aboriginal students at the same time - 19,735 children entered Grade 1 in 1976. Of these, 18,746 entered Year 10 and 18,474 completed the year. Again, 13,887 students enrolled in Year 11 at the beginning of 1987, and although the numbers fell quite significantly, nevertheless, 11,225 non-Aboriginal students entered Year 12 at the beginning of 1988 and 10,300 completed the year.

The marked difference in retention rates is quite alarming. Only 71.11% of the Aboriginal children who started Grade 1 in 1976 actually entered Year 10 in 1986 - the final year of compulsory schooling in Western Australia - and of these only 61.16% completed the year. Compare this with the 94.9% of non-Aboriginal children who entered Year 10 in 1986 and the 93.97% of the original Grade 1 intake who completed the year. A comparison of the figures for the final two years of schooling is even more devastating. Only 26.14% of the Aboriginal children made it into Year 11 in 1987 compared with 70.37% of the non-Aboriginal students. These figures then dropped lower to 7.98% of Aboriginal and 56.88% of non-Aboriginal students actually beginning Year 12. The final figures for completion of Year 12 are 6.89% of the original Aboriginal population and 52.23% of the non-Aboriginal population. As successful completion of Year 12 is essential for tertiary entrance it is obvious that very few Aboriginal students will have the opportunity of attaining the benefits which may accrue from a university training in the professions which are financially rewarding. Discrepancies such as this give educators real cause for concern.

The failure of Aboriginal children to succeed in the European orientated education system of Western Australia has long been of considerable concern to teachers and educational administrators. Probably the greatest hurdle to be considered is the fundamental difference in values between the traditional "white"* Australian culture with its predominantly European system of wealth, property ownership and status [Conway, 1978], and that of Aboriginal Australians, where the most important values in life are the depth of one's human relationships and the spiritual ties with the land. In many ways the two cultures are diametrically opposed. Nevertheless it should be possible to use the knowledge of Aboriginal character traits and learning modes which is available, together with current knowledge of cognitive processes, to improve the academic achievement of Aboriginal children for, "There is a great deal of giftedness among the culturally different and the waste or under use of these resources is tragic" [Torrance, 1977, p.3].

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* The Ministry of Education of Western Australia is opposed to all forms of racism. It is regrettable to constantly have to designate groups of students as "aboriginal" or "white". Unfortunately, in the interests of clarity it is necessary to do so in this paper.

Some Concerns Regarding Aboriginal Cognitive Development

Because Aboriginal children have been reared with a high degree of independence and autonomy, they will not submit to the autocratic teaching practices still found in many WA schools. Of course this also holds true for the small percentage of European children reared with a high degree of autonomy and may, in part, be a contributory factor to the growth of alternative schools in recent years. As Yonemura states,

> Ironically, the children who so desperately need to experience control and power are often deprived of it. They become passive memorizers of educational scripts to which they make no original contribution and which do not expand and enrich their day-to-day experiences.
>
> [Yonemura, 1986, p.474]

The most successful teachers of Aboriginal children seem to be those who treat the students with the same degree of respect they would accord their colleagues; they *ask* for things to be done rather than issuing commands and allow for a high degree of flexibility and negotiation in their curricula. These facctors of course help to provide the autonomy which fosters Aboriginal self-esteem. They are also the hallmarks of teachers who are successful in fostering creativity in the classroom. The failure of teachers to adapt their methods can lead to violent confrontations (witnessed by the author) and absenteeism.

Hunting and gathering economies do not appear to foster the development of "future" orientation to the same degree that

this occurs in agricultural economies where one must carefully plan the sowing and cultivation of grains and vegetables to ensure future survival. Like low SES Europeans, Aborigines tend to be "present" and "past" oriented and are "future" oriented to a leser degree than middle class Europeans [Massey, 1978]. In other words, they recall and revere the past; make the most of every opportunity in the present but sometimes fail to understand the need for planning or working for the future. This lack in degree of future orientation undermines any long term extrinsic reward system and may make it difficult for Aborigines to understand the need to learn abstract information, e.g. algebra, which for many has no relevance whatsoever to current needs. Many Aboriginal children cannot make the cognitive leap to understand the relationship between the study of abstract ideas today and tomorrow's vocational options. Class management systems based on long term extrinsic rewards, e.g. "Everyone who is good will get a jelly bean at hometime," are doomed to failure for the same reason. Thus it makes it imperative for teachers to ensure that lessons are vivid, exciting and provide instant success in order to reinforce intrinsic motivation.

The instant success is particularly important when teaching Aboriginal children for failure is totally unacceptable to them. The traditional learning modes are indirect and based on imitation and modelling [Harris, 1980]. In traditional areas children watch their elders until they think they are ready to copy the strategy. They will then begin to practise what they have seen. No one will ever tell a child that what he/she has done was wrong. Rather, a close relation who is significant to the child will show him/her what must be done to get it right.

Unlike the average European child, Aboriginal children do not expect to fail or to have to learn from their failure. For Aboriginal children failure is followed by loss of self-esteem, withdrawal and often a complete refusal to re-attempt the solution of a problem.

An excellent example of the inductive learning mode of Aboriginal people is provided by Peter Willis (1986) in his description of an adult education training programme. One project in the programme consisted of preparing a float which was to head the procession through Alice Springs on National Aborigines Day. Unfortunately "many were reticent about such assertive behaviour. They used the word shame-job, meaning shameful. They were non-committal." (1986, p.35) Fortunately, this situation was not to last,

> The senior trainee went to the adult educator in the home management course and asked if students in her sewing class could make banners 'for the march.' He also asked to have the banner-making take place in the main seminar room since most students went through it to the tea room. The chosen decorations were symbols of the Arrente people to which the adult education trainees belonged and on whose traditional land Alice Springs was built. Many Aboriginal students had links with Arrente people.
>
> When the students on their way to the tea room stopped to look, the senior trainee gave them paint and asked for ideas. The junior trainee passed the word that all students could make a symbol or poster

> and that classes were cancelled for those involved. The seed grew. More people stopped to draw a poster or to paste up photographs. The senior trainee was quiet and unobtrusive. He asked for ideas, looked for assistance, praised those who helped. Work on the decorations pre-empted regular classes. Students freed from study were buoyant and creative. The day before the march, a giant semi-trailer arrived to be transformed into a float. The poster-makers and decorators wanted to see how their decorations would go over, but some still hung back from the great display float even when their children swarmed over it. The two trainees climbed aboard and within seconds the trailer was full of people on their way to celebrate their own 'coming out'.
>
> [Willis, 1986, pp.35-36]

Thus, without a 'plan' as such or a program, the Aboriginal educator (senior trainee) had set the process in motion and the project was successful both in terms of the final product and in the achievement of its underlying aims to raise Aboriginal awareness and foster self esteem.

Besides teachers who have failed to come to terms with the nature of Aboriginal children, there are many other reasons for the problems experienced in Aboriginal education. To begin with, virtually all education run by the government is in English, thus children of five who have spoken only an Aboriginal dialect or Aboriginal English, which is a form of Kriol, are expected to learn to read in a foreign language -

standard English - before they have ever learnt to read in their own. Of course, some enlightened teachers do use language experience approaches but the use of basal readers, which exhibit artificial language and situations foreign to Aboriginal children, is hard to eradicate.

The Aborigines are a pragmatic people and unless children can see the relevance of what they do at school, to elements of real life, they are simply not prepared to spend time and concentration on that activity. All too often teachers fail to appreciate the need to articulate the relevance of everything they do. Often too they

> ... neglect ... children's experiences and the denial of relevance of those experiences to established fields of knowledge stunts children's intellectual growth and diminishes who they are and what they can become.
>
> [Yonemura, 1986, pp.474-75]

The interruptions to schooling are a problem for children and teachers. Prior to white settlement, Aboriginal people moved through their tribal hunting grounds in a more or less annual circuit determined by the seasons, the available food and water supplies and deaths in the family. Today, Aboriginal people are still highly mobile, which means that many children move frequently from one school to another and back again, with gaps of anything from a week to six months between leaving one school and signing on in another. Furthermore, due to the importance of kinship ties, children may be kept at home for up to a week to enjoy the company of relatives who may be visiting.

Failure to appear at a family funeral is considered a deadly insult. Because the people are so mobile this often necessitates a journey of several hundred kilometres. Thus children can be out of school attending a funeral for upwards of three weeks, occasionally as often as four or five times a year.

It is obvious that with this sort of absenteeism plus the almost inevitable inability to keep up, child initiated truancy is frequently the next step.

A different kind of absenteeism which could be termed 'mental' rather than physical can make quite a drastic interruption to schooling. It is created by the existence in many country towns of long running family feuds which occasionally boil over into violent and bloody clashes among adults. The children, particularly teenage children, tend to become passionately involved in the slights and injustices allegedly perpetrated by the "other" side. Frequently, the problems seep into the school yard. The children are far too upset with what is happening in the community to be able to concentrate on schoolwork and sometimes much time is spent out of class while teachers try to sort out fights and settle grievances.

Traditionally speaking, the Aborigines could be said to be "fast food kings". In the hot Australian sun, food begins to rot very quickly so very little could be stored for day to day use. There was little preparation. Food was either thrown onto the hot coals or eaten raw, very soon after being caught or collected. After the invasion of the white man, his restriction of traditional hunting grounds

> ... meant giving up the so called 'primitive' but far more nutritious 'bush food' and adopting the ultimately disastrous 'poor European's diet' of tea, sugar and flour.
>
> [Folds, 1987, p.452]

The Aborigines' diet was changed but not the "fast food" attitudes. Today this often means that children are fed food from tins, packets or fast food outlets, all of which are frequently low in nutritional value. In many rural areas, particularly on the desert margins fresh fruit and vegetables are often scarce and very expensive and the traditional foods which provided vital vitamins, e.g. vitamin C, are now neglected, with the result that many Aboriginal children suffer from varying degrees of malnutrition during their formative years - a fact which must affect cognitive development.

Finally, the vast majority of Aboriginal children live in circumstances of extreme poverty and suffer similar learning problems to children from other cultures who grow up in a low SES environment. Under no circumstances does this researcher subscribe to the idea of a cultural deficit in this regard; rather the low SES environment is frequently rich and stimulating. However, it is not a culture which promotes schooling. Also poverty brings the attendant problems of malnutrition, disease and overcrowding, all of which can affect the type of cognitive development necessary for high achievement at school.

Yet even if it were possible to solve all of these problems with the stroke of a magic wand and despite the fact that we do

have a considerable body of knowledge which could be used to expedite Aboriginal learning, it is doubtful if this alone would cause the success rates of Aboriginal children at school to improve sufficiently to put them on a par with their "white" counterparts, and there are several fundamental reasons for this which will be discussed further in the Literature Review.

Nevertheless a great deal of knowledge has been accumulated and in view of this, it would seem that the state of Aboriginal education in Western Australia should be in far better shape than it appears at present.

Unfortunately, although there have been some individual success stories, the situation for the majority of Aboriginal children appears to have altered little in the last ten years. This is certainly not for want of effort on the part of the Aboriginal Education Branch of the Education Department as it existed until 1987. Massive amounts of money have gone into specific projects in schools in remote areas and into special publications for Aboriginal children [Piggott, 1989].

In some areas, schools have gone to considerable effort to involve the local Aboriginal community in a joint attempt to tackle the problems of Aboriginal schooling. However, projects which involve the school, and the community, are highly dependent for success on the personal communication skills, special knowledge and innate abilities of the principal. Not all principals possess the special knowledge, insights, personal characteristics and sensitivities which foster success in this

type of inter-cultural project. Therefore many schools never receive the support of this bridge between cultures.

In the tertiary area both the TAFE system and the major tertiary institutions promote courses specially geared for Aboriginal Adult Education. These courses extend from those providing assistance in the acquisition of basic literacy skills through trade and business courses to careful nurturance of students through teacher training courses. It is hoped that in the future a large force of Aboriginal teachers will be available to work in the field of Aboriginal Education. However, as yet that force is very small and has been able to make little impact on development or statistics.

It would seem that part of the blame for this, at least, must be with the administrative bodies of the Ministry and the tertiary institutions which have failed to implement in the schools the vast body of knowledge which is available. To begin with, despite the fact that for approximately ten years Western Australian tertiary institutions have provided elective courses for student teachers in the field of Aboriginal education studies, there are still not enough teachers with specialised knowledge in the area of Aboriginal Education to staff all the schools with large numbers of aboriginal children. Surely, instead of providing an elective, a compulsory course, should have been a fundamental segment of the teacher training course for not just ten, but perhaps even the last fifteen years. Even now, only one institution does this - the Western Australian College of Advanced Education.

Secondly, the courses provided by the tertiary institutions are not standardised and their quality could be said to run from excellent to barely adequate.

Thirdly, the areas where Aboriginal children may be located in large numbers are generally remote and usually in 'hard living areas' that is, on the fringes of the central desert or in the extreme tropical north. In each case Europeans frequently find the climate trying and even if trained in the teaching of Aboriginal students may be reluctant to travel 3,000 kilometres from home to work in such circumstances.

Fourthly, even when fully trained as an Aboriginal Education specialist and prepared to work in remote areas young teachers are not guaranteed a post in such a school. It is not unusual for the Ministry to send such a teacher to a school with only half a dozen Aborigines, none of whom will be in that teacher's class during the year. For all these reasons then, though we now have a considerable body of knowledge, that knowledge is not being implemented in the schools.

This introduction has dealt with the researcher's reasons and purpose for embarking on this area of study. It has provided a definition of special terms used and an overview of the research design. Some background to the study has been provided in the form of an overview of the current retention levels of Aboriginal students and a consideration of some concerns regarding Aboriginal cognition, together with the failure of educational institutions to implement in the schools the body of knowledge regarding Aboriginality which is currently available.

LITERATURE REVIEW: INTRODUCTION

Research into the literature regarding Aboriginal creativity quickly emerged as a search along two quite separate paths into two quite separate fields of study. As a wealth of information exists in both areas it has been decided to divide the literature review into two main sections, Aboriginality and Creativity, in order to simplify study for the reader. The Literature Review section will conclude with a drawing together of the salient points from both themes.

THE ABORIGINAL PERSPECTIVE

Cognitive Issues

This section of the Literature Review is further divided into two subsections, the first of which will deal with the issues which appear to inhibit, in people from minority or third world cultures, the development of modes of thinking which are beneficial for schooling. These include cultural discontinuity, political constraints, Vygotsky's belief that all cognitive development is culture linked and the concept that different cultures with different needs produce different modes of thinking in their citizens. The second subsection relating to the Aboriginal Perspective is an examination of Aboriginal child rearing practices in a remote community. It details quite clearly the practices, their effects on the children and by implication, the value systems of the culture.

Wallace and Adams (1988) see cultural discontinuity where "the culture bearers can not sufficiently pass their knowledge to the subsequent generation" [Williamson, 1987, p.60] as a major factor inhibiting the cognitive achievement of Zulu children in Natal. They see Zulu culture in a state of flux,

> ...a state of transition of such magnitude as that of moving from third world to first world [status,

> where] there is often a rejection of the past cultural heritage. Young people tend to become alienated from those adults who are still deeply embedded in the past culture; parents may become merely people who fulfil only biological needs. Parents themselves may feel inadequate, ignorant and unskilled, wanting their children to be successful in the first world culture yet themselves unconsciously embedded in their own ... culture or suspended between cultures and living largely in a cultural void.... The children are receiving ... [input] that is disconnected, fragmentary and conflicting; values, attitudes and behaviours are in dissonance.
>
> [Wallace & Adams, 1988, p.73]

This plight appears to afflict many third world cultures and most minority cultures within a dominant, usually European culture to a greater or lesser extent. Thus, the rich and complex culture of traditional Aboriginality has been torn asunder by the need of this minority group to come to terms with the wider non-Aboriginal society. As such, although a few thousand people manage to cling to their traditions while living on remote outstations, a great many Aboriginal people live in a no-man's land of conflicting value systems, customs and beliefs [Honeyman, 1986].

Williamson, in deploring the destruction of Inuit culture, supports this theory of cultural discontinuity.

> Parents, although very capable, are not in a position where they can pass on their knowledge of the soul

> system, the environment and/or the language ... youngsters see the traditional knowledge as secondary to what the schools provide, and as a result children are no longer an integral part of Inuit traditional culture.
>
> For most Inuit youngsters the human being (Inuk) is no longer seen as an integral part of the environment and universe; but a superior one imposing his will on the habitat. Animals are no longer his equals but are minor beings. Rarely are the communal souls of animals offered gestures of respect when hunted for food. Such an attitude makes it next-to-impossible for the children to cooperate with the natural order of the Arctic climate and Inuit culture."
>
> [Williamson, 1987, p.60]

Williamson quoting Valentine, explains that

> The purpose of schooling is to prepare Inuit children for more advanced types of employment in Arctic industrial centres for well-trained, sophisticated Eskimo-employment which will enable them to live richer, more interesting lives.
>
> [Williamson, 1987, p.61]

It is easy to draw parallels between the paternalistic overtones in the imposition of Canadian mainstream schooling on Inuit children and the imposition of mainstream schooling on Aboriginal children by successive Australian state governments. The stated intent of most state governments in Australia for

the schooling of Aborigines is education for choice. Unfortunately in the process of providing some of the skills necessary for survival in the new culture, the option for survival in the Aboriginal culture is systematically undermined. In both Inuit and Aboriginal society the result is the same.

> The tragic consequence of this unresolved conflict is that by the time children finish schooling - as young adults - they have not had the opportunity to learn the values or skills for life in their own environment.
>
> [Williamson, 1987, p.61]

On the other side of the world the desert Aborigines of Central Australia are experiencing similar problems.

> In sum, Aboriginal parents send their children to school so that they might learn the functional academic skills needed to ensure community self-management. But frequently school mainly serves to exacerbate a generational gap between the young and old which is already tearing many communities apart.
>
> The break-down of traditional Aboriginal authority and social structure is symbolised most poignantly by alcoholism, Kava abuse and petrol sniffing. In some communities afflicted with petrol sniffing it is exceptional to find a child who is *not* a sniffer and those as young as five take up the practice. As the Foley Report (1984, p.50) describes the situation 'a whole generation of Pitjantjatjara and Yunkunyatjara children are growing up on petrol fumes'. Deaths are

> common and hardened petrol sniffers are often not considered worthy of initiation into manhood and so remain 'children' regardless of age. As such they are excluded from sacred/ceremonial life. The Aboriginal run Nganampa Health Council (1985, p.3) sums up the social and cultural impact of petrol sniffing in stating that the practice 'robs youths of years of education both in traditional ways and in the skills needed to cope with the dominant society'.
>
> [Folds, 1987, p.449]

Today, as adults, tribal Aborigines are denied the autonomy or self-management which traditional child rearing practices have led them to expect and their "relationship with the dominant white Australian society [is] best characterised as 'dependency'" [Folds, 1987, p.451]. As a result the following passage from Williamson describing the Inuit, could just as authentically be describing the Aborigines:

> Most ... settlements have examples of (such) wastage, drifters who are unable to adapt to the loneliness or the employment conditions of the town, but who despise traditional employment and live parasitically off the sharing pattern of the community.
>
> [Williamson, 1987, p.61]

Thus in the conflict of cultures there are always victims; individuals who "... are deprived of their own culture..." [Wallace and Adams, 1988, p.72], i.e. the process by which knowledge, values and beliefs are transmitted from one generation to the next.

Secondly, Folds (1987) contends that these political and "historically structured socio-cultural constraints" [1987, p.451] for example, the dependency under which Aboriginal communities must operate, have much to do with the failure of Aboriginal schooling, yet have previously remained unconsidered. As he explains,

> schools legitimate themselves in the context of the dependency relationship they are embedded in, that is, ... they generate ideologies which legitimate their institutional power and the fairly obvious inequalities they reproduce.
>
> [1987, p.453]

Aborigines are aware of this, so

> it is not surprising that Aboriginal resistance [to European learning, becomes] ... another overlooked factor in the social relations of Aboriginal Education.
>
> [Folds, 1987, p.454]

Thirdly, recent theory suggests that all cognitive development is culture linked.

> Vygotsky emphasises the importance of a cultural transmission from adult to child that is coherent and which provides a cognitive scaffolding within which the learner can build simple and then complex concepts. The role of the adult is that of mediator and interpreter of the child's experiences.
>
> [Adams and Wallace, 1988, p.132]

In fact some cognitive theorists even go so far as to say that culture can actually be responsible for changing the structure of the brain [Tsunoda, 1984]. Therefore without a cohesive cultural fabric from which to work, the development of the forms of cognition conducive to success at school is limited at best.

For more than ten years it has been considered that Aboriginal children *think* differently from European children [Christie, 1978; Kierans, undated], and that non-Aboriginal educators do not really understand or know how to capitalise on just how Aboriginal problem solving operates. In research to date [Kierans, 1976], it has been shown that the visual spatial memory of Aboriginal children is clearly superior to that of approximately 80% of "white" children by slightly less than three years.

The problems experienced by Aboriginal children in reading and mathematics are legend in Australian educational circles and, in the writer's opinion, are considered to be due to the fact that Aboriginal culture does not foster linear thinking. Aborig-inal people appear to solve problems by handling not one, but several variables at a time in a more "holistic" fashion than that evidenced in Euro-pean problem solving based on linear logic. A good example of this was pointed out to researchers on a trip to the Kimberley region in 1981. A bright, alert, artis-tic fourteen year old boy was pointed out by his mathematics teacher. His achievement in standard maths was at approximately Grade 3 (eight year old) level, yet he could solve an intricate Chinese block puzzle (a large number of wooden pieces with protuberances in all directions which had

to be fitted together to form a complete cube) in about five minutes. No European child in the school could solve the puzzle. As the frustrated teacher said, "If only that child could verbalise his thinking while solving that problem I'd be half way home to teaching him some maths."

Interestingly, Knapp (1981) tends to contest this concept. In her research she found that "the evidence for strictly definable differences in cognitive style between Aborigines and Europeans ... [was] not as clear cut as might have been expected" [p.163] and implied that despite cultural differences Aboriginal failure at school may be due more to poor teaching skills than one would like to admit.

She contends:

- that traditional Aboriginal society demands not only superior visual memory skills but also aural memory skills. For example the children must learn in detail myths, songs, kinship rules, the geography of the land, the location, identities and life cycles of plants and animals, etc;
- that the use of symbols in tracking an animal through the bush is comparable to reading books;
- that "Aboriginal people can also use 'higher mathematics' without a number system. Kinship relationships operate on permutations and combinations which even the most astute anthropologists have difficulty in fully comprehending" [1981, p.165-66]

and that as a result there should not be any great disparity in the learning abilities of European and Aboriginal children. However, the significant factor is that in traditional

Aboriginal society all of this is accomplished successfully because "*it is meaningful and has utility in everyday life*" [Knapp, 1981, p.163]. The downfall of Europeans as teachers of Aboriginal children lies in their failure to provide a basis for the relevance of schoolwork in real life. Thus, the

> ... Aboriginal child will not effectively transfer his cognitive skills ... [because he does not have] the context understandings that are available to the European child...." [1981, p.165]

It is while considering Aboriginal modes of thinking that the element of creativity emerges as a variable needing increasingly urgent attention. The indications are that Aboriginal children are creative thinkers and the literature stresses quite clearly that the needs of creative thinkers are different from those of convergent thinkers [Clark, 1988; Skromme, 1985, 1988; Carr and Borkowski, 1987]. Thus, it seems evident that there is a high degree of probability, that creativity is an important variable to be considered when examining Aboriginal success or failure at school.

For many years after Binet produced his scale of mental abilities in 1911, Western educators were obsessed with the assessment of the individual intelligence of their students. Now intelligence tests, for example those constructed by "Wechsler [and] ... Binet ... tend ... to concentrate on the assessment of convergent thinking" [Carr and Borkowski, 1987, p.40], but educators eventually began to realise that the preoccupation with IQ had resulted in the neglect of the needs and qualities of divergent thinkers and their unique contribution to the human fabric is only now becoming fully appreciated.

> Man's greatest achievements are often the products of creative insights and intellectual skills. Such achievements often result from an ability to think divergently, especially when a person is confronted with a novel problem solving task. Divergent thinking is important because it results in flexible, unusual, but generally useful solutions to problems.
>
> [Carr and Borkowski, 1987, p.40]

In a study of hundreds of inventors Skromme (1985) discovered, among other things, that they had an average of 11.6 years of schooling only and that "None of them would have been accepted in our Gifted Children programs" [Skromme, 1988, p.354]. As selection for Gifted Children's programmes tends to be limited to students scoring in the top 2% of the population [Ainsworth, 1980], i.e. approximately all scoring over IQ 135 on current (convergent thinking) tests [Gay, 1985], this is not really surprising. Inventors by the very nature of their categorisation are creative people and divergent thinkers. Skromme is very concerned with the apparent failure of American schools to nurture their divergent thinkers, but the situation exists world wide. In the UK and Australia the dearth of original inventive thinkers is concerning both government and industry (lectures given at Churchlands CAE in July 1989 by Dr David George, Dean of Faculty of Science, Nene College, Northampton, UK, and in August 1989 by Mr Jim Hopkins, Consultant, Education of Academically Talented Students, Ministry of Education, WA). As Skromme (1985) states:

> Heretofore we have harvested creativity wild. We have used as creative only those persons who stubbornly

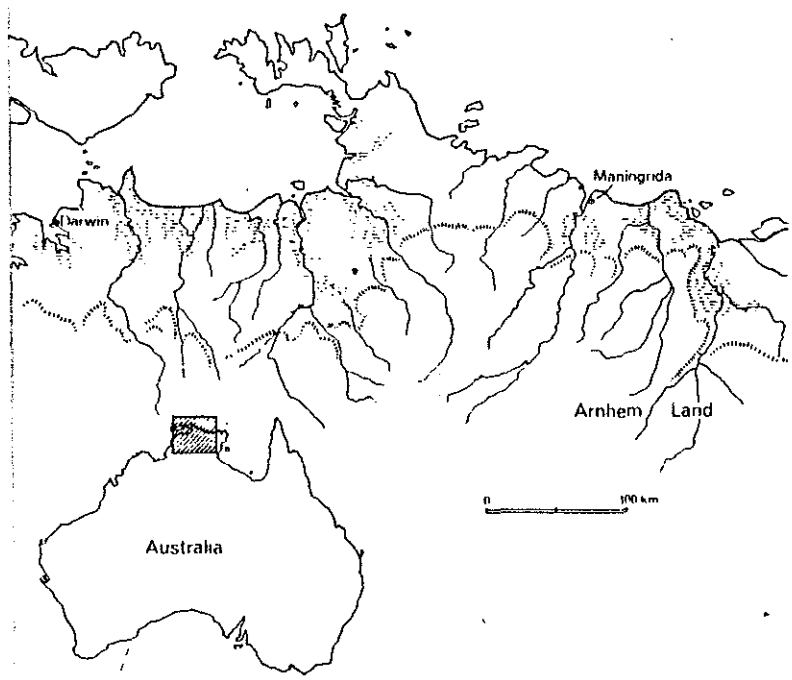
> remained so despite all efforts of the family, religion, education, and politics to grind it out of them.

Indeed, anyone working in the field of creative and gifted children has horror tales to tell of the suffocation of spirit endured by creative children who have failed to cope with the system [Dalton, in print; Skromme, 1985]. Thus, if creative European children find the system alien, imagine just how much more difficult the situation must be for Aboriginal children who have not only been reared to be creative but within the family have also come to expect that their creativity will be accepted and employed.

The considerable amount of research into the needs of gifted and creative children and adults over the last thirty years has yielded a solid body of knowledge of subjects, methods and materials which can be employed to provide a more satisfactory educative process (see Creativity section). The knowledge is abundant but what will now be needed is the will to change and the finance necessary to retrain approximately 90% of the state's teachers, who have failed to break from the repressive moulds in which they themselves were taught, to enable them to become the kind of teachers who encourage creativity in the classroom [Allen, 1985; McLeod and Cropley, 1989; Skromme, 1988]. Significantly, the changes would not just provide Aboriginal children with a better educational process, they would also provide considerable advantages for European students and ultimately for Australia as a whole.

Aboriginal Child Rearing Practices

The four issues which most significantly mark the differences between Aboriginal and European child rearing practices are those of ownership, development, socialisation and discipline. The behaviours exhibited by the Anbarra people of the Northern Territory (see Map 2:1) plus reference to other communities where appropriate, will clearly illustrate these differences.



The Liverpool River estuary and part of the north coast of Arnhem Land to show the location of Maningrida settlement.

FIGURE 2:1 Hamilton: 1981:1

The Anbarra people are a sub-community of the Gidjingali people and live in a traditional Aboriginal community in North East Arnhem Land to the east of Darwin on the north coast. In *Nature*

and Nurture, Annette Hamilton (1981) reports on anthropological field studies carried out in 1967 and 1968 in which she studied the child rearing practices of the Anbarra people in considerable depth, and it is her observations of life at Maningrida which are discussed here.

Ownership

The Anbarra people believe that babies "pre-exist" [Hamilton, 1981, p.10] as spirit children prior to both conception and birth.

> These children select the woman they want for a mother, based partly on her physical appearance [see Ashley-Montagu, 1937, p.33 for a similar belief in Central Australia] and partly on her existing children their number and temperament. They [then] enter her directly through the vagina if she is menstruating or alternatively they may turn themselves into fish or animals to be eaten later by her.
>
> [Hamilton, 1981, p.21]

This idea that the child chooses the mother is immediately significant as it infers a level of autonomy, a right of choice on the part of the spirit child. "Thus their manifestation as people is dependent on their own whim; ultimately there is little man can do to coerce them and little to avoid them" [ibid, p.28]. Ownership precludes choice, therefore if the child does have choice then the argument must hold that

ownership is absent. In fact, this is true and the Anbarra parents have little or no sense of "ownership" of children. Instead, the attitude taken is that children know what they want and that no one has any right to interfere with their pursuit of whatever that may be. As Hamilton states, she had "never thought it possible for children to have so few restraints and their parents, so few anxieties about them" [p.12].

This situation is very different from Western society where, in the writer's opinion, parents consider that they "own" their children in the same way that they "own" material possessions. Psychologically speaking, this ownership gives parents immense power over children. By law parents have the right to educate their children in any way they see fit and barring actual cruelty and severe physical and/or sexual abuse, are left to their own devices to get on with the job.

Development

Table 2.2 indicates the events of child development according to the Anbarra people. The Anbarra do not count the 'ages' of their children in years but rather judge the child's development according to its position along the scale of development shown.

TABLE 2:2

Events of child development according to the Anbarra model

Before conception	The spirit child 'in the dreaming'
Conception	Catching a spirit child
Birth	*Wupa* - inside; *Yokoko* - the tiny one
3-6 weeks (diffuse attachment)	The smile. *Andalipa* - the boy; *djindalipa* - the girl
6 months (intense attachment to mother)	Sitting up *Awudjularkudja* - he who sits on the shoulder
18-24 months (leaving mother's body and breast - hates mother)	Giving up mother. *Adjorkidjera* - the frightened one.
3 years (joins peer group in camp)	*Anbaitjuda* - the cheeky one.
5 years (leaves camp group to join other children)	*Dalipa'djaringa* - the 'kid mob'.
9-12 years (pre-puberty) (boys to bachelor's camp, girls to their husbands)	*Wana* - the big ones. *Ngamanguma* - the breasts.
Men	*Wura*
Women	*Gama*

[Hamilton, 1981, p.16]

Both the unborn child and the infant are known by the slurred term 'yokoko', (slurred from the word 'yukiyuko') "but the word 'wupa' (inside) is used to indicate whether or not the child is 'in utero'" [p.17]. Once the baby smiles, somewhere between three to six weeks, it becomes a 'child' and childhood begins.

Europeans are invariably surprised at the accelerated pace of physical development in Aboriginal children. This is not genetic but rather a result of the amount of stimulation given to Abori-ginal babies. The need for early development in a highly mobile economy is obvious. In the past children needed to be able to keep up with parents as they moved through the

tribal territory. Furthermore, parents needed their hands free for hunting and gathering along the way, so the need to carry children was dispensed with as early as possible. Although the group now lives in a stable settlement, the latter need is still valid.

From birth, people are keen to nurse the new baby "and a baby less than a day old may be passed around from hand to hand until it protests" [Hamilton, 1981, p.27]. The newborn infant would then be fed and placed in a paperbark cradle. Then,

> if it is fretful it is fed and if still fretful, rocked and joggled up and down.... But in the main the baby lies on its back in the cradle over its mothers knees, surrounded by the movements and sounds of the camp ... more and more often the baby is taken from the cradle...."
>
> [ibid, pp.29-30]

and passed from hand to hand being greeted each time with a specific gesture which prompts the smile response.

> The more time the baby spends out of the cradle, the more physical stimulus it receives - it is patted, joggled, lightly pinched and sometimes not so lightly slapped.
>
> [ibid, p.30]

By six weeks Aboriginal babies seem to be able to control their heads and can look about them at will.

Babies are always in physical contact with others and are never left alone. If a mother needs to do something away from the

camp, she picks up the baby and takes it with her.

> Babies must snatch sleep whenever they can and most babies I observed slept no more than an hour at a time and were woken up rather than waking themselves. [p.31]

If this processing is compared with that of "...European babies, [who] spend much of their time in cots and cribs, and even alone in a room with the door closed..." [p.31], the difference in stimulation levels is obvious.

The last really noticeable difference between Aborigines and Europeans in their treatment of infants lies in the area of feeding. Since Aboriginal children are never left to cry, the minute this happens the child is put to the breast. But the more a baby is awake during the day, the more often it is fed, since any disturbance, distress or excitement is terminated by feeding" [p.32]. In the 1950s and 1960s European parents were encouraged by many members of the medical fraternity to feed their babies at certain set intervals and if they woke early and cried with hunger the mothers were expected to leave them to cry until the stipulated time for the next feed.

In Table 2:3, Hamilton [1981] indicates the possible educative elements in each of the feeding styles.

TABLE 2:3

	Anbarra	*European*
Baby	No hunger, feeds irregularly is constantly full	Regular hunger, not allowed to feed except at regular intervals
Expectation	That there is always plenty of food	That food is not plentiful and hunger is painful
Adult	Eats irregularly, eats everything available; never worries about later	Eats regularly, always leaves some for later, worries about having enough
Values?	Generosity	Thrift

[Hamilton, 1981, p.32]

Finally, "Early infancy is a period of hurly-burly contact with the world and its inhabitants, in which the child must either survive and adapt or die" [p.46].

> While Anbarra babies go through the same rapid advance in growth and learning [between 6 to 18 months] as all other babies during this time their parents attach no special significance to any of them and the phenomenon of the parent anxiously awaiting the baby's first steps so that it can catch up with the neighbours' child is unknown. Almost all babies can sit unsupported by 6 months, by 8 months they can crawl and by 11-12 months they can take several steps alone.
>
> [p.4]

Once a child can sit unsupported they are carried on the mother's shoulders without support and are expected to hold on to the mother's hair for safety. "Children between 6-18 months appear passive and dependent" [p.56] and rarely leave the camp.

Breast feeding continues until a new sibling arrives, which, in the past is believed to have been between 2-3 years. However, today social changes have caused this to happen far more frequently. No woman over 30 believed that solid food was necessary for a child under 18 months. "Hence the older women think the idea of giving European 'baby tucker' to children under 6-7 months is absurd, and will prefer to throw it away or eat it themselves" [p.52]. Thus, despite the efforts of the clinic sisters, who sometimes even provide the food, it is not unusual for young children to be suffering from some form of malnutrition. This of course must have some affect on the development of the brain and therefore the development of cognition.

During this 6-18 month developmental period, another area of difference between Aboriginal and European cultures lies in the realm of language development. Whereas "European children usually have a vocabulary of 22 words [by eighteen months], Aboriginal children seem to use no words at all" [p.64] other than the terms for 'mother' and 'father'. Otherwise all their needs were more than adequately met by laughing, crying, grabbing or using some other non-verbal means of communication.

A third factor governing cognitive development lies in the settled nature of the camp today. In the past, the people travelled through varying terrain almost constantly, in their more or less annual circuit through tribal territory. Children under two and a half years of age travelled on their mothers shoulders from where they had an excellent view of the terrain over which they travelled.

> As they travel, their mothers point out things and places to them, saying 'see where uncle speared a kangaroo', 'watch that bee, good honey somewhere', 'there is sweet water here' and similar comments. This has information content and the mother's voice takes on a sing-song caressing tone.... The combination of sing-song repetitive words and rhythmic movement of the mother as she walks along beneath the child provides what seems to be an optimal learning situation in which the child can hear relevant information while at the same time seeing a particular place.
>
> [p.59]

Unfortunately, now that the camp is a permanent settlement these forays through their territory are quite limited and "Mothers never attempt to instruct their children in this way when sitting at home" [p.59]. Hamilton believes that as a result

> This significantly alters the amount and kind of visual and other stimuli received by children, [and] the sedentary life has nothing to replace the range of experience offered by constant travel through varying territory.
>
> [p.58]

Socialisation

The copious amounts of stimulation received by Aboriginal babies in comparison with their European counterparts has already been detailed. This of course does have a socialising as well as a developmental effect. Another socialising practice is to nurse even quite small babies with the child facing out into the social group, its back against the mother, rather than face into the mother as Europeans tend to do.

The handling of sibling rivalry is particularly interesting.

> ... sibling rivalry ... was very subtly expressed. Violent rage and the desire to hurt are not directed at the new baby but at the mother. Since no one tries to control the child's behaviour, its anger is expressed without inhibition. But no one takes any notice of it until the child is spent and exhausted.
>
> [Hamilton, 1981, pp.68-69]

During this time the child may hit, kick and bite the mother and pull her hair. The mother may hit out but rarely hits the child and may even continue to e.g. play cards, while under assault. If the child is interfering with what an adult is trying to do it may be picked up and carried kicking and screaming to wherever the other small children are playing and left to finish screaming and eventually join in the play with the other children.

> Children never act with this degree of violence towards the sibling ... Their feelings toward the rival are disguised as affection, and while kissing

> and cuddling the baby they often manage to push, pull and bother it sufficiently to make it cry ... This disguised hostility persists as long as the baby is helpless but behaviour towards siblings changes once the younger one can walk and by the time it is 18 months old, possibly with a new sibling on the way, the relationship between the older two is usually warm and supportive in the small play group of related peers.
>
> [Hamilton, 1981, pp.69-70]

The peer group is of extreme importance in Aboriginal society taking

> "over some of the functions that [Europeans] ... consider the preserve of parents particularly those concerned with elimination, washing and wearing clothes.
>
> [ibid, p.76]

Because children want to be the same as their older brothers, sisters and other relatives, they quickly copy whatever the older children do. In this way, for example, simple toilet training is accomplished without the traumas often experienced in European homes.

> The most noticeable thing about peer group activities is how seldom there is any hostility or aggression between the children and how often they show great consideration for the feelings and safety of each other, often much more than the adults show for them.
>
> [ibid, p.76]

Hamilton experienced this directly when her young son joined the peer group.

> I found my own child changing. He became more generous, more outgoing, more temperamental and emotional, and utterly unafraid of the camp....
>
> [ibid, p.12]

> For boys, in particular, the peer group is an extremely important source of companionship. Many boys have a special friend and 'co-member' of the group with whom deep and lasting attachments are made. Even after circumcision pairs of boys can be seen arm-in-arm or holding hands. Their relationships with one another and with the group are characterised by affection and mutual aid, and contrast strongly with similar European groups where boys are continually attempting to order themselves as individuals in dominant hierarchies.
>
> [ibid, p.104]

Within the peer group,

> There [was] ... very little argument over the possession of things ... The usual course is that if two children want the same thing the one who starts to cry first will be given it ... a nearby adult will say ... 'Give it to him, see he's crying, he wants it'. This is considered a perfectly adequate reason for possession. Older children soon learn this lesson but instead of crying first themselves they forestall

> a younger child by giving him whatever he wants as soon as he wants it.
>
> [Hamilton, 1981, pp.76-77]

Within the peer group, age was not a problem as there were none of the inferiority-superiority relationships exhibited by European children of disparate age, and dominance by the 'big kids' is unknown. The lessons modelled had been well learnt. Parents didn't put down or attempt to control children, so older children didn't try to dominate younger ones. Just as Aboriginal parents made few demands on their children (and none on children under six or seven) so older children made no demands on the younger ones.

From the parents' point of view, provided that the "child remains unhurt, does not hurt other children and keeps out of their way" [ibid, p.77] the parents are content.

Thus Aboriginal child rearing appears to be "governed by the principle of never interfering in the child's activities until it or another, indicates distress" [ibid, p.50].

The right to express one's feelings in an uninhibited manner, and the autonomy to control one's own activities at a very early age, would seem to promote a reduction in frustration and anxiety; an equivalent increase in self esteem and result in a generosity of spirit towards others.

Discipline

From the European viewpoint there appears to be no discipline whatsoever meted out to Aboriginal children. This is detailed in Hamilton's own observations and "Most references from the earliest accounts to the present describe the treatment of Aboriginal children by adults as indulgent" [p.9]. Malinowski (1963) quoting Curr, states "Parents were much attached to their children and rarely punished or corrected them" [p.234]. In fact, quoting Curr again, "they were habitually indulged in every way, and as a consequence, in the case of boys at least, grew up as self-willed thorough little tyrants as well can be imagined" [p.239].

Curr's comments are somewhat extreme and do not match the observations of others. Within the traditional Aboriginal community, children gradually developed into considerate and respectful community members. This is supported by Brough Smith, also quoted by Malinowski (1963) who in describing the people of the Lower Darling River tribes (in NSW) states

> children are not only very leniently treated by their parents, but ... they are not spoilt at all. One word from the parent is generally sufficient to check a child when doing wrong, and the greatest respect is shown to parents by their children.
>
> [p.240]

Malinowski (1963) also quotes Matthew, who says of the Kabi and Wakka tribes

> The children are never chastised either by the father or the mother. But they are nevertheless obliging and kind. The black children are not ... as bad as one might suppose, considering their education, in which their wills are never resisted.
>
> [p.245]

Finally, Malinowski (1963) looks at the comments of Bishop Salvado discussing the Aborigines of the Swan River district in Western Australia. He noted that

> whatever a child might do, it is never chastised. If a small boy wishes to obtain something from his parents he cries, bites and beats them until he succeeds in that purpose.
>
> [p.247]

The accent here should be on the word 'small' for it is usually the younger children who behave in this way. By primary school age this sort of behaviour would be considered inappropriate and because younger children want to behave like their older siblings such overt violence would rarely be seen.

Despite the lack of demands on very young children, as they grow older, girls in particular are expected more and more to assist in the care of infants and small children. The reason for this is obvious. In traditional times most girls were married by the age of about eleven, so the years between about seven and eleven were committed to learning practical child care and domestic chores. They also tend to do a lot of fetching and carrying for older members of the group and although usually obedient to these requests, are not forced to be so.

> It does happen that a girl will refuse to obey, [a request] in which case she either continues with what she is already doing or runs away out of earshot. There is no punishment for such behaviour. She is not abused or struck, others making no attempt to influence her. It is entirely a matter between her and the ... [person] concerned, and when a girl refuses others merely shrug saying perhaps 'she is deaf' and that is the end of the matter. There is no subsequent reminder of her behaviour. The same [person] will not refuse a request from her for food or money simply because she has refused to obey him. Events of the past have no effect on attitudes of the present; each new interaction is treated on its own merits; unaffected by the past history or the girl's behaviour.
>
> [Hamilton, 1981, p.107]

By about the age of twelve most boys have been taken away for initiation and circumcision, and after this have joined the bachelor's camp. This is the time of strict discipline for boys. They desperately wish to be seen as men of worth so the intrinsic motivation for compliance with the strict codes of adult behaviour is very strong. The attainment of further fulfilment in the spiritual life of the tribe also demands considerable discipline in the learning of song cycles, history, ritual and the intricate kinship laws.

Sanctions for adult community members who break the strict codes are immediate and range from ridicule through serious injury to death, although the last occurs infrequently in this day and age.

The practices detailed above are largely those of the Anbarra people, however Malinowski's sources plus writers such as Harris (1980), indicate that similar practices occur in other communities and other parts of Australia. Aboriginal child rearing practices certainly are very different from European practices but as Hamilton states

> If the aim is for a less fearful, timid and anxious approach to whatever conditions confront us in the future, it may be that people such as the Australian Aborigines can teach the most valuable lessons of all if we have the wisdom to interpret correctly and adapt creatively to future needs and possibilities.
>
> [Hamilton, 1981, p.169]

The child rearing practices are significant because the varying practices used by different cultural groups have produced different cultural outcomes. The Australian mainstream culture produces a child who is a competitive, future oriented linear thinker used to having his/her activities closely curtailed and controlled and is generally fairly acceptant of external controls. The education system has then been carefully structured to accommodate and reinforce these orientations. Aboriginal culture, on the other hand, produces a child who is cooperative rather than competitive; is "past/present" oriented; is a "holistic" or "multi-variate" independent thinker who expects to make all his/her own decisions and is almost totally unacceptant of external controls.

Almost nothing in the mainstream education system is structured to accommodate and/or reinforce these orientations. Interest-

ingly, these attributes are also considered to be those of highly creative children [Wallace, 1986; Clarke, 1988]. Reports indicate that many teachers have similar problems managing creative children as those they experience trying to cope with Aboriginal children [Smilansky and Halberstadt, 1986].

Teachers can be told that Aboriginal children are different but until such time as a rational explanation of the reasons for these differences is provided, few will be prepared to make any substantial changes. It would seem important in the future for all teachers to be made aware of the specific differences in child rearing practices so that they can review their curriculum and management techniques. Accordingly the benefits of this "re-thinking" would then be available not only for Aboriginal children, but also for the children of the prevailing mainstream culture.

This section of the review has dealt with the issues which appear to inhibit the cognitive development necessary for scholastic success, of people from minority cultures and specifically Aboriginal culture. These issues included cultural discontinuity, political constraints, Vygotsky's belief that all cognitive development is culture linked and the concept that different cultures with different needs produce different modes of thinking in their citizens.

The Aboriginal child rearing practices of a remote community have also been discussed together with the effects these have on Aboriginal children and by implication, the value systems inherent in Aboriginal culture. Finally, the significance of

these differences and their relationship to the mainstream education system has been detailed.

CREATIVITY

Historical Perspective

Philosophically speaking the study of creativity, together with other components, fits into a

> structure d'ensemble which can best be subsumed under the heading of humanistic psychology ... founded by William James.... It consists of seven aspects: (1) a broad humanism, (2) measurement, (3) intelligence, (4) gifted children, (5) creativity, (6) development, and (7) parapsychology."
>
> [Gowan, 1979, p.4]

William James' *Varieties of Religious Experience* was published in 1902 but the seeds of the creativity movement had been cast even earlier than this, when Charles Darwin first began to investigate the origin of the species (1859). As a result of Darwin's interest in heredity, Francis Galton, his cousin, began looking at the question of intelligence and heredity. This was important because "prior to Galton (1869), no one had investigated the individual differences of human beings" [Clark, 1988, p.15].

Unfortunately, it was many years before anyone could determine with even the smallest degree of authority what had been

inherited in the manner of intelligence because prior to 1908 there was no way in which any valid comparison could be carried out.

The breakthrough came in 1908 when a Frenchman, Alfred Binet, produced his Scales of Mental Ability. For the first time the significance of age differences in intelligence had been brought to light. Furthermore, "the significance for future mental development of a given degree of retardation or acceleration" [Terman, 1926, p.2] could readily be seen.

However, even before actual measurement was possible, the idea that intelligence and creativity might not be closely aligned, had appeared in the literature. At Harvard in 1898 Dearhorn had studied the responses of undergraduates to inkblots and noted that some students of high intellectual ability had performed quite poorly in the creativity mode [Getzels and Jackson, 1962].

Again, after a study of primary school English compositions in 1902, Colvin had concluded that logical power did "not seem to accompany any particular element of spontaneity" [Getzels and Jackson, 1962, p.4].

The effects of the industrial and political upheavals in Europe and America during the eighteenth and nineteenth centuries had led to significant philosophical changes in government policy. The result was that the children of the "civilized" world were being educated in progressively increasing numbers.

By the beginning of the twentieth century the educators of every nation were battling with the problem of how best to cope with the millions of children who were now to be educated. Thus, the twin problems of identification and measurement which continue to bedevil researchers today, were in the very early years of the twentieth century, problems of quite massive proportions, so Binet's breakthrough was particularly well received. Then, at the Fifth Congress of Experimental Psychology in Leipzig in 1912, the German psychologist, W. Stern, presented an article in which he suggested

> the use of an intelligence ratio or quotient, which refined, still further, the method of Binet and made possible more accurate comparisons of children of different ages.
>
> [Terman, 1926, p.3]

As people began to use the new intelligence test some interesting facts emerged. Lewis Terman, a researcher at Stanford University, was responsible for dispelling one folk myth in the area of intelligence and that was the preconceived stereotype of the highly intelligent child. After studying thirty one children with scores above 125 IQ in 1913-14, he had published an article in 1915 called "The Mental Hygiene of Exceptional Children" in which he challenged accepted beliefs. Terman stated that far from being the weedy, eccentric, knock-kneed misfits with pebble glasses and freckles which had previously been the assumption, very bright children more often

than not were quite munificently endowed. These children often seemed to have everything, from robust health and good looks, to superb coordination and athletic ability, leadership skills, creative ability and aesthetic skills and aptitudes.

While these facts were of immense interest they did little to illuminate the elusive relationship between creativity and intelligence, but in 1916 the work of Laura Chassel provided further evidence of the fact that high intelligence or giftedness did not automatically betoken a high level of creativity. She studied children's performance on many different tests which included tasks based on both convergent and divergent thinking. She found that performance on logic tests bore little relationship to performance on the creativity tests [Getzels and Jackson, 1962].

While some researchers like Chassel continued to work on teasing out the relationship between creativity and intelligence, many other academics were seduced by the fascination of intelligence testing.

In 1921 Lewis Terman, while still at Stanford University, revised Binet's scales to produce the Stanford-Binet Intelligence Scale; a test which is still used today although it has had several revisions since 1921. After the revision of Binet's scales, Terman began an immense research project which was to last for many years. He began by selecting more than 1,500

students of 11 years of age, all of whom had IQs of over 140. These students were tested and measured physically and psychologically as well as intellectually, and an immense amount of personal data was recorded regarding such variables as position in the family, number and sex of siblings, parental attitudes and values and interests and hobbies. In many instances siblings were also studied [Terman, 1926, Vol.1].

Unfortunately, it was during this time that one concept was solidified, which was to retard educational thought for nearly forty years. As a result of the work of Galton, psychologists and educators had come to think of levels of intelligence as fixed. Binet himself had never held this belief for "He believed intelligence to be educable..." [Clark, 1988, p.16], but when people began to use his scales and later revisions of them, the idea that intelligence was a fixed and unchangeable entity entered into academic theories and became a belief which did not fall into disrepute until the 1960s.

Unfortunately, despite massive and indisputable support for the concept of educable intelligence, the old ideas of fixed intelligence have taken a long time to die in the schools. Any teacher who has tried to move children in and out of different school programmes can attest to the resistance encountered here, whereas in the writer's opinion, a school philosophy founded on the concept of educable intelligence would by definition promote easy interchange.

Throughout the next three decades the testing of intelligence became immensely popular. During World War II whole armies of men and women were tested for placement in special areas and courses and millions of schoolchildren were tested for a multitude of purposes. However, right from the beginning the "effectiveness of the IQ as a comprehensive measure of cognitive functioning was challenged by a number of people" [Getzels and Jackson, 1962, p.4].

The failure of intelligence tests to adequately delineate information regarding creativity, had been clearly stated by Simpson as early as 1920, and it was obvious that "giftedness in intelligence and giftedness in creativity were by no means synonymous" [Getzels and Jackson, 1962, p.5], yet oddly enough the selection of gifted children for special programmes and specific study continued to be based on their intelligence test results. Furthermore, "The crucial question as to whether creative ability might not of itself be related to school achievement was simply never raised" [Getzels and Jackson, 1962, p.6].

In the thirty years from 1920 to 1950, interest in creativity was at a very low ebb while the identification and measurement of intellectual giftedness caught the popular interest. In fact,

> Prior to Dr J.P. Guildford's famous inauguration speech of 1950, only 186 technical papers had been written on creativity.
>
> [Skromme, 1988, 356]

In this speech to the American Psychological Association, Guildford stated that

> Many people believe that creative talent is to be accounted for in terms of high intelligence or IQ. This conception is not only inadequate but has been largely responsible for the lack of progress in the understanding of creative people...."
>
> [Getzels and Jackson, 1962, p.6]

Guildford himself, with various colleagues, then set out to devise a test which would measure what he called 'divergent' thinking as different from the convergent thinking needed for high achievement on intelligence tests. A number of these followed, including tests in *Alternate Uses* (1960) in collaboration with Christensen Merrifield and Wilson: *Making Objects* (1963) with Gardner, Gershon and Merrifield; and *Match Problems* (1963) with Berger.

It was also during this period that a contemporary of Guildford's, E. Paul Torrance, became involved in the development of tests of creativity. Both

> Guildford (1975) and Torrance (1962) hypothesise[d] that there ... [were] four abilities which seem[ed] to be manifested - fluency, flexibility, originality and elaboration. Fluency is the ability to generate quantities of ideas in problem solving situations; flexibility is the skill to change an existing pattern of thought to a new pattern; originality is the production of off-beat unexpected solutions; and elaboration is the ability to extend ideas or to perceive detail and consequences.
>
> [Wallace, 1986, p.70]

Today, the Torrance Tests of Creative Thinking (1966), in both the verbal and figural formats, have been widely used. "Probably ninety-five percent of the researchers and educators who use divergent thinking tests use ... [these]" [Davis, 1983, p.87].

The tests mentioned thus far have all been tests of divergent thinking, however, there is another form of instrument which is considered to be equally efficient in the prediction of creativity as divergent thinking tests and this is the biographical/personality inventory. Instruments of this nature include the *Alpha Biographical Inventory* (1966) from the Institute for Behavioural Research in Creativity; *The Biographical Inventory-Creativity* (Schaeffer, 1970); *The Creativity Attitude Survey* (Schaeffer, 1971); *The Renzulli and Hartman Creativity Rating Scale* (1971); *The Group Inventory for Finding Talent*

(Rimm, 1976; and the *Group Inventory for Finding Interests* (Davis and Rimm, 1980, 1981), among many others.

Besides the proliferation of creativity tests which were devised during the sixties, the decade is important for one other conceptual breakthrough - the breaking of the deadlock on attitudes towards fixed intelligence. Prior to the 1960s, educators and researchers who disputed the idea of intelligence as immutable, even when they could produce evidence to back their claims, for example, Montessori (Standing 1966) and Wellman and Skeels (Skeels et al, 1938; Skodak and Skeels, 1949; Wellman, 1940) were regarded with suspicion by the academic world and their findings were obliterated in a "storm of protest" [Clark, 1988, p.18] from the establishment. However, in the late fifties, another team including some of Wellman's earlier workers, conducted a similar study which was adapted to counter the criticisms which had been made regarding Wellman's earlier data. Their results (Skeels and Dye, 1959) were very positive and a follow up study run by Skeels in 1966 produced results which were "at the very least, provocative" [Clark, 1988, p.18].

Wellman's research had indicated that social interaction and mental and physical stimulation could increase intelligence scores and although her ideas were initially ridiculed support for her beliefs finally began to accumulate in the early sixties. Dennis (1960), while observing orphanages in Iran, found babies of twelve months who could not sit up and children of four who could not walk unaided. These children were un-injured and had been adequately fed, yet their maturation had

been arrested and they had failed to develop along the preconceived and accepted lines of belief.

At this time too, the work of the Russian researcher, Vygotsky, finally became known in the West. Vygotsky believed that the child developed as a result of his/her relationship with the environment. In fact,

> The cultural development of the child is characterised first by the fact that it transpires under conditions of dynamic organic changes. Cultural development is superimposed on the processes of growth, maturation and the organic development of the child. It forms a single whole with these processes.
>
> Both planes of development - the natural and the cultural - coincide and mingle with one another. The two lines of changes interpenetrate and in essence form a single line of socio-biological formation of the child's personality.
>
> [Vygotsky, 1960, p.4 quoted in Lee, 1985, p.174]

Thus, he considered that

> All the 'higher' mental functions were social in origin and that learning could therefore lead and direct the quality and speed of maturation.

Finally, all of this, together with the work of Piaget (1952), Sontag, Baker and Nelson (1958), Kagan and Moss (1962) and Benjamin Bloom (1956, 1964) meant that a new theory of intelli-

gence was long overdue. Ultimately the idea that the development of intelligence was interactive and dependent not just on heredity but also on the quality of one's environment became accepted by the academic establishment. As will be seen later, this would be particularly significant for the creativity movement because the importance of a nurturing environment for creative-gifted children would soon emerge as a particularly powerful factor in their development.

Creativity - A Definition

For many years researchers have sought for a sound and all encompassing definition of creativity. "Newell, Shaw and Simon (1964) ... proposed that a creative act is a special kind of problem solving, that it is the act of solving an ill-defined problem" [Hayes, 1981, p.199]. Barrow (1975) suggested that "A necessary condition of being creative [was] that one should produce some original work that ... [was] one's own" [p.150] and that "... a creative person must produce works of quality...." [p.151]. Barbara Clark (1988) defines creativity as "the highest expression of giftedness" [p.45], a definition with which few would disagree but which seems somewhat inadequate when one wishes to pin down precisely the knowledge, practices, concepts and beliefs which spring to mind when the word 'creativity' is used. However Clark (1988) does go further to classify into four categories some of the many definitions for creativity which have been provided in the past. These four categories she explains are based on quite different views of the world in general and creativity in particular. She defines the groups according to their function and labels these as:

Rational thinking

Feeling

Talent

Higher levels of consciousness

1. The Rational Thinking Group

The first of these is the group which views creativity as "A rational thinking function" [p.48] in which cognitive ability, talent and personality combine to produce a creative product. Above all they see creativity as measurable and trainable. Furthermore "this view of creativity has accumulated the most literature and nearly all of the testing" [p.48]. To highlight the focus of each group, Clark (1988) then quotes definitions of creativity from several well known researchers in the field. The 'rational thinking' viewpoint is epitomised by the following definition from Guildford (1959):

> aptitude traits that belong most clearly logically in the area of creativity ... fluency of thinking and flexibility of thinking, as well as originality, sensitivity to problems, redefinition and elaboration ... classifiable in a group of divergent thinking abilities [p.160].
>
> [Clark, 1988, p.49]

2. The Affective Group

Adherents of the second group see creativity as a function of feeling. They focus on the emotional well being and self actualising qualities of the human being. For these people creativity forms more of an "attitude or belief system that permeates all the life choices of the creative person" [Clark, 1988, p.59].

They, like Ferguson (1973 quoted in Clark, 1988), would agree that "There is a strong likelihood that creativity does not need to be developed in man but simply liberated" [p.289].

Definitions of creativity from researchers in the field who hold this view are well represented by that of Moustakas (1967):

> To be creative means to experience life in one's own way, to perceive from one's own person, to draw upon one's own resources, capacities, roots.... Only from the search into oneself can the creative emerge" (p.27). He believes that in true experience every expression is creative, the creation of the person one is and is becoming.
>
> [Clark, 1988, p.59]

3. The Vested Talent Group

The third group sees creativity from the talent aspect where "The criterion for evaluating creativity ... is how original, inventive or imaginative the product is" [Clark, 1988, p.63].

The perspective of its supporters is evidenced in the following definition from

> Rogers (1959) [who] in recognizing this type of creativity describes, "emergence in action of a novel rational product, growing out of the uniqueness of the individual on the one hand and the materials, events, people or circumstances of his life on the other." (p.71)
>
> [Clark, 1988, p.63]

4. The Higher Consciousness Group

The fourth viewpoint is that of creativity as "a function of higher levels of consciousness" [Clark, 1988, p.64]. In other

words people who hold this viewpoint see creativity as a result of a markedly different cognitive style. It is generally accepted by educators that most of the work set for children in schools develops the left side of the brain [Grady and Luecke, 1978; Clarke, 1988; Bogen, 1975], that is, the area which deals specifically with linear functions, logic, analysis and verbal forms. The right side of the brain which deals with the world in a far more "holistic" way, seems responsible for the kind of thinking which deals with patterns, relationships and non-verbal forms [Preen and Barker, 1987; Grady and Luecke, 1978; Bogen, 1975]. In a very simplistic sense it could be said that the left side of the brain deals with convergent thinking and the right side of the brain with divergent thinking. Many researchers feel that a greater knowledge of and development of the right side of the brain could lead to a greater under-standing and development of creativity. As a result

> Researchers have begun to explore altered states of consciousness as possible areas of information on creativity. They examine the use of drugs, trances, hypnotism, meditation, chanting, dreams, fantasies and daydreams for clues to lead us to the intuitive, creative spark.
>
> [Clark, 1988, p.65]

Though perhaps less 'rational' than the other three views of creativity, the reasons for this view are no less valid. One researcher who epitomises this view of creativity as a function of higher consciousness has provided the following definition of creativity:

> Taylor (1963): "There is reason to think that much

> of the creative process is intuitive in nature and that it entails a work of the mind prior to its arising to the conscious level and certainly also prior to its being in expressible form. It is most likely preconscious, nonverbal or preverbal, and it may involve a large sweeping, scanning, deep, diffused, free and powerful action of almost the whole mind" (p.4).
>
> [As quoted in Clark, 1988, p.65]

As far as a definition of creativity is concerned, the problem which now presents itself is that even with all the ideas presented across four different categories of academic thought, the sum of the parts, though large, is still less than the whole. In other words each definition has an element or elements which can be quite rationally accepted into an overall picture of creativity yet one is still left with the feeling that something has been omitted and that an all inclusive definition of creativity continues to be elusive.

It is here that the work of two other researchers needs to be considered. After many years of study in the field of creativity and cognition, David Perkins believes that creative ideas do not suddenly descend out of the blue or bubble up from the depths of the psyche like a geyser. There is rather, a detectable flow of conscious thought from the first glimmerings of an idea through to the realisation of a creative product. As he states, creativity

> ... isn't some kind of magic. If you look at the steps that might have led from Darwin's reading of

> Malthus to his insight about natural selection, you find that each step makes sense.... That doesn't mean that each step is a deductive step - we aren't talking about formal logic - but each step is discernably connected to the previous step, not a leap, not something out of the blue.... In general creative people call upon their minds with questions different from those less creative people ask of themselves.... I like to say it's a style - a way of deploying one's abilities.... Creative people tend to be less solution minded than non-creative people. They think hard not just about what the answer is ... but what the problem should be: how the problem might be formulated.
>
> [Perkins, quoted by Brandt, 1986, p.14]

This idea of creativity being the result of a sequence of related thoughts ties in with the thinking of Portia Elliott (1986) who had difficulty coming to terms with the idea of creativity simply emerging as a result of right brain activity. She argues that

> creative behaviour is a product of our uniquely human capacity to will ... that for creative potential (or any human potential) to be released, the prefrontal lobe, those 'cells of will', must be engaged, thereby facilitating the harmonious functioning of the entire brain (left-right, top-bottom, back-front) and thus regulating all psychological functions associated with the creative process.
>
> [Elliott, 1986, p.203]

Elliott's ideas/concepts earn greater consideration when one considers the problems and frustrations which arise during the creative process and the strength of will needed by the creative person to actually complete the creative product. Certainly human volition plays an immense part during creativity and without it, creativity fails to occur.

Perhaps the last word in the 'definition of creativity' debate should be left to Ferguson (1973) who supports the notion of whole brain function as essential to creativity. As he says,

> The view of creativity as a non-intellectual activity fails to take into account the dynamic unitary and coherent nature of the brain. Emotion and intellect, freedom and discipline, reason and intuition, the precise and the gossamer, primary and secondary processes, chaos and order - all of these apparent opposites can exist in creative harmony in the human brain.
>
> [Ferguson, 1973, p.295]

The Creative Person

> The creative person is by definition one who generates creative products ... [For this] one must be motivated and ... possess certain cognitive abilities. These ... [include] perceptual attitude

> and ability, conceptual complexity, deductive - analytic ability and inductive - synthetic ability ... White (1959, 1960) ... [coined the term] ... 'effectance motivation' ... [to explain the deep sense of commitment or] 'urge toward competence' ... [which drives the creative person to conceive, labour at and finally produce a creative product of quality] ... Through this motive, the individual desires a sense of 'competence'. This desire is satisfied [only] by feelings of 'efficacy' upon the attainment of competence as perceived by the individual.
>
> [Pearlman, 1983, p.296]

The difference between achievement motivation and effectance motivation is that the latter has an internal base while the former has an external base. The creative person may well be pleased by external recognition of his/her work but this will be totally disregarded if the work has failed to satisfy the personal criteria of the creator. Thus, the creative person chooses to be dependent on his/her own judgement and criteria when assessing his/her worth as a creator and it is this inner drive to satisfy personal criteria and ideals which White (1959, 1960) labels "effectance motivation". In the actual judgement of the product two criteria appear to be prominent. The first is the level of technical difficulty or challenge involved, while the second is the level of competence achieved.

In the past, genius was regularly associated with neuroticism in the mind of the general public, however Terman's (1926) studies soon dispelled the idea that this was inevitable by

providing ample support for the idea that in fact the most able were almost always the most mentally well adjusted.

Creative people, too, by definition are generally well adjusted, confident, mentally healthy people [Terman, 1915, 1926]. This is fairly essential to their ability to function as a creator for as Smith and Carlsson (1985) see it

> the motivational force behind creative functioning has to do with the experience of conflict; why else should anxiety, even if moderate, be a typical companion of creative activity.... People with a creative set do not suppress conflict-laden material but introject the contradictions as part of their own self, the accompanying anxiety and discomfort notwithstanding.
>
> [p.330]

This Janusian thinking (Rothenberg, 1979) requires constant mental effort to satisfactorily juxtapose opposites and accept the validity of both while holding both in a delicate balance. At times the balance may slip and result in dramatic mood swings or temporary depression but generally speaking, unless the mental strength is there to regain the balance, the creative output will cease. The mental strength necessary to withstand years of adverse criticism yet retain one's integrity of belief (e.g. Cezanne, Van Gogh) is another facet of the creative person's character.

Of course, the determination, "effectance motivation" and strength of integrity of creative people often makes them difficult to manage particularly while they are children.

> Ample evidence supports the notion that teachers prefer highly intelligent to highly creative students in their classrooms (Holland 1959, Torrance 1962, Getzels and Jackson 1962, Hudson 1968) and that this sentiment is mirrored by creative students through complaints of boredom and teacher incompetency (Getzels and Smilansky 1983).
>
> [Smilansky and Halberstadt, 1986, p.197]

Highly creative children are usually considered to have high energy levels, a strong sense of identity, independence and autonomy; and high initiative, imagination and intuition. They are often self-confident, risk takers capable of operating successfully in the face of opposition from their peers. On the negative side they may well be aggressive, impulsive and tenaciously questioning, with little concern for social restraints. Ingenuity may sometimes be carried to diabolical extremes and the normal school restraints be met with outright rebellion [Wallace, 1986; Clarke, 1988].

Of course, many creative children do seem to cope well with school life but these seem to be those with a very high IQ and/or a supportive culturally rich family life. Smith and Carlsson (1985) found evidence to suggest that children from academic homes were also "favoured by what [they] ... thought to be their self confidence" [p.332].

On the other hand many high creativity, low intelligence children may cope poorly with school particularly under stress situations, for example, an excessively repressive teacher or system (Wallace, 1986).

Finally, something should be said about the sensory propensities of creative children and adults. They almost invariably have a heightened sensory awareness of the world about them though at times may appear over sensitive and over reactive to everyday situations. Interestingly this heightened sensory perception contributes to the creative person's ability to view the world with the added richness and depth of metaphor which thereby assists in the delicate balancing act of Janusian thinking. Similarly this autocentric view of the world enables the "creative individual [to remain] ... more open, less bound by cultural constraints" [Lubeck and Bidell, 1987, p.35] and thereby more able to consider and produce the original.

Ultimately, one of the most fascinating features of creative people is to see the similarities across personality profiles. So closely linked is personality to creative performance that Perkins (1986) states,

> Creative people tend to be more individualistic on personality measures.... Interestingly enough, personality measures detect truly creative individuals with considerably more reliability than do ideational fluency measures.
>
> [Perkins, p.14]

THE CREATIVE PROCESS

The ability to entertain and accept each of two quite opposite points of view is believed to be fundamental to the creative process. Rothenberg (1979) calls it Janusian thinking

> ... after Janus the Roman god of doorways ... whose faces ... look in different directions at the same time ... contrary to the ... notion that creativity grows largely out of inspiration, the 'primary process' thinking of dreams, or some unconscious source. I have found Janusian thinking - a major element of the creative process - to be a fully conscious, intentional rational process.
>
> In Janusian thinking, two or more opposites or antitheses are conceived simultaneously, either as existing side by side, or as equally operative, valid, or true.
>
> [Rothenberg, 1979, p.55]

It is interesting to note that "Janusian thinking seldom appears in the final artistic product, but it occurs at crucial points in the generation and development of the work" [Rothenberg, 1979, p.56]. The persistent theme of all the more recent literature (i.e. post 1975) is that the creative process is one of considered thought. It may not fit into a pattern of 'logical' thought but there does appear to be a pattern of structured thought. As Stanish (1986) states, "It is with structure, I believe, that creative thinking begins. Randomness does not initiate creative thought but a structure will" [p.111]. Of course randomness may at a later date be used to

solve elements of the problem and be fully integrated within the structure, but the structure must come first.

To imply that this enables us to fully understand the creative process would be a fallacy. Despite the research there is still considerable confusion as to how creativity actually 'works'.

> The classical theory of the process of creativity falls into four stages:
>
> 1. preparation, when a problem is investigated in every possible way;
> 2. incubation, when the problem is stored below the level of the conscious mind;
> 3. illumination, when the solution comes as if by intuition - the famous 'a-ha' feeling; and
> 4. verification, when the new idea is evaluated by the creator.
>
> [Wallace, 1986, p.68]

It is now reasonably well accepted that creative thought while not *logically* organised as in convergent cognition, is nevertheless, structured thought which can be worked on by the artist or inventor in accordance with his/her will. However, how the brain actually produces the leap from preparation to illumination or why it succeeds with one person yet fails with another, remains a mystery.

The Creative Product

No discussion of creativity would be complete without a consideration of the creative product, for without this we would have no proof of creativity. When considering the creative product, it is immediately obvious that some form of criterion is necessary before one can define a creative product. Barrow (1975) was particularly concerned that quality should be the hallmark of the creative product. In fact, so concerned was he with the importance of quality as a criterion of creativity that he stated that "The long term happiness of the human race is dependent on maintaining a formal commitment to the importance of standards" [Barrow, 1975, p.155].

This need to provide criteria for the better understanding of creativity was summed up by MacKinnon (1978) who believed that any creative product, be it an idea, a scientific theory, a building or an artifact, must meet certain criteria to qualify as being truly creative. He said that it must be original and adaptive to reality (in other words, it must be useful). The creative originality must also be seen and appreciated by others. The product should be aesthetically pleasing and finally (a criterion achieved by few) that the product should "create new conditions of human existence, e.g. Darwin's theory of evolution..." [pp.50-51].

Finally, Taylor (1975, discussed in Wallace, 1986) suggested that there were also five hierarchical levels of creativity. These he called expressive, technical, inventive, innovative and emergentive, the latter being rarely attained as it repre-

sents "a truly original idea or the ultimate abstraction, for example, the work of Einstein or Picasso" [Wallace, 1986, p.71].

The Creative Environment

Walker (1986) "suggests [that] at least five [main] elements, in addition to such general features as justice, fairness, economic prosperity and freedom" [p.220] are needed to produce the ideal environment for promoting creativity.

1. The psychological climate must be sound and healthy. Maslow (1972) asserts that the relationship between creativity and psychological health is profound, vital and obvious....
2. Adequate cultural resources must be available. Arieta (1976) states that a Beethoven could not have flourished in eighteenth century Africa where there was no possibility of studying music adequately....
3. Significant people must be present. Research indicates that a solid majority of eminent people were stimulated by teachers and other adults....
4. Incentives for inventiveness must exist. The idea that 'what is rewarded in a society will be cultivated there' is self evident....

5. There must be tolerance for diversity. Our obsession with transmitting cultural heritage and maintaining the status quo makes us suspicious of diverging views.

...If Darwin had lived at the time of Galileo, he would not have allowed himself to reach the conclusions he did, even had he obtained the requisite evidence. (Arieta, 1976).

[Walker, 1986, pp.220-221]

An interesting study of Chinese genius by Kuo (1987) gives further support to Walker's five principles. The study

> indicated that the geniuses lived in an atmosphere where literature was 'generally valued' or 'greatly involved or supported' by the emperors or people in the society.... [For example the] warlord ... Ts'ao T'sao ... Being a literary genius himself, ... provided a complete freedom of expression ... he urged the talented, even if they were immoral to come serve him. Hundreds of literary men gathered in the capital city. Writing, appreciating and commenting on poems and prose became a normal social activity among the intellectuals ... they studied together and competed with one another. Thus seven eminent writers stand out and various styles of writing were developed.
>
> [Kuo, 1987, p.8]

During periods in which personal freedom was restricted, for example, the Ching dynasty or when literature was devalued

during the Han dynasties, geniuses either failed to emerge or were severely limited in numbers. Again, where "A style of expression or certain kind of content ... is cherished by an emperor, [this too] may hinder creativity in the long run" [Kuo, 1987, p.10].

Finally, when comparing periods of turmoil, growth and peace and prosperity, it is clear that the "massive and continuous appearance of the first class geniuses which lasted for more than 100 years coincided with periods of prosperity and stability" [Kuo, 1987, p.6]. It is particularly interesting to note that of the geniuses who emerged during periods of turmoil only one was impoverished by war. All the others "were under the protection of the royal court and the scholastic society or led retreated lives in the village or monastery" [Kuo, 1987, p.6].

Ziv (1983) found significant evidence of links between humorous atmosphere and the promotion of creativity. The establishment of a "fun mood" before the activity

> gave [students] a 'justification' to search for 'unserious' answers" .... [p.73]
>
> Secondly, the technique of humour ... is based chiefly on incongruity ... [thus] humour diverts thinking from the usual, logical course...
>
> A third feature ... is the contagious aspect of laughter ... [which] had a positive reinforcing effect....

> Finally, ... Instructions to use humour are perceived as a cue which triggers the generation of non conventional thinking. [p.74]

Thus, humour not only promotes a relaxed and psychologically healthy atmosphere it also stimulates the imagination.

From this, it is quite clear to see that the environment in which he/she lives has a powerful effect on the promotion or repression of creativity in the individual.

Creativity and the Brain

Recent research studies [Gazziniga, 1975; Grady and Luecke, 1978] have indicated that the human brain rather than being a single entity is in fact two organs joined by a thick bridge of nerve tissue known as the corpus callosum.

While apparently alike, each part or hemisphere of the brain carrying its half of the load of basic bodily functions, there are in fact some quite significant differences in function between the right and left hemispheres and structurally they are asymmetrical (Gazziniga, 1975; Grady and Luecke, 1978).

The new knowledge and understandings have led to further developments in creativity theories. The split brain theorists hold that

> the right hemisphere carries out intuitive, holistic and simultaneous operations (such as creative imagin-

> ing), and the left carries out linear, sequential and verbal operations (such as reading and calculating).
>
> [Grady and Luecke, 1978, p.7]

This would imply that the left brain is the seat of convergent thinking skills while the right brain deals with divergent cognition. As it is well known that the vast majority of educational strategies used in schools and universities serve to develop convergent cognition [Grady and Luecke, 1978; Clarke, 1988; Bogen, 1975] and that most right handed people and approximately two thirds of all left handed people are left brain dominant, then it is highly feasible that educationally speaking the focus for development of the brain has long been out of balance. Certainly, a great deal more needs to be done in schools to develop right brain cognition if only to balance the heavy accent on left brain development. However, our societal needs for right brain development go much deeper than this. The critical state of our world environment has indicated quite suddenly the need for

> a shift to the holistic mode of consciousness. The rational/linear approach to problem solving has blinded people as they undertook technological advances without looking at the total scene. In the environment linear answers [a result of our cognitive thinking process] have developed a path that could lead to society's extinction. Why was it not obvious to people that certain technological advances were leading to environmental extinction? Perhaps the emphasis on the linear, rational and analytical process caused this problem.
>
> [Grady and Luecke, 1987, p.34]

If Grady and Luecke are right then the implications of need for development of right brain functions are both urgent and profound. Skromme (1988) cites the same urgency of need for the development of creative problem solving.

While a greater access to right brain cognition is seen as a prerequisite for creativity, one other phenomenon of the brain is seen as particular to the creative.

> In an interesting study, Martindale (1975) found that creative people show a pattern of brain wave production during creative activity and creativity testing that is the reverse of those less creative.... Creative people produce fewer alpha waves when relaxing and increase them when working on an imaginative problem. [As alpha waves are slower than average brain waves], the creative seem to have higher resting levels of brain wave activity [and lower working levels of brain activity] than average people.
>
> [Clark, 1988, p.66]

At present this new insight is being treated as an interesting phenomenon because as yet there is little understanding of how the knowledge could be beneficially applied.

Finally, consideration should be given here to the work of the pre-frontal lobe (see p.70/69 for earlier discussion) in "synchronising the brain and releasing creative potential" [Elliott, 1986, p.207]. In her article Elliott details the famous case of Phineas Gage who was injured when "a railroad

blasting accident sent a tamping iron through ... [his] skull" [Elliott, 1986, p.210]. Although he recovered physically, the pre-frontal lobe damage left him psychologically impaired. From a once shrewd and energetic businessman of some respect he became a coarse, loud mouth incapable of completing any of the grand schemes which had flitted across his mind. "The ... balance between his intellectual faculties and animal propensities, seem[ed] to have been destroyed ... [and] he engaged in purposeless acts until his death" [*ibid*, p.211]. His ability to transform ideas and plans into realities, his will, was completely destroyed. Thus, without will, creativity too, fails. In the production of the creative product the role of the pre-frontal lobe is essential.

Creativity and Intelligence

Creativity does not appear to be closely linked with intelligence although "people with below average IQs tend not to be creative" [Hayes, 1981, p.199]. On the other hand educational research infers that our schooling systems may actually prevent people with low IQs from being creative (Good et al, 1987; Weinstein, 1983).

In studies reviewed by Weinstein it was generally considered that low ability students were given less autonomy, less choice, more rote learning and less opportunity for divergent thinking and problem solving than high ability students. Of course teachers believed this would enable low ability children

to achieve a measure of success and in some cases it may have done. However, the large body of knowledge attesting to teachers' inability to identify high ability children (Terman 1926, Torrance 1978, Maltby 1984, Clark 1988) and the large number of highly creative and/or highly intelligent children who consistently under achieve tends to set one considering the chicken and egg principle. Of one factor however, there does seem to be little doubt,

> ... above a certain IQ level, such as 120 ... there is very little relation between creativity and IQ. It is as if there is a certain minimum IQ required for creativity, after which IQ doesn't matter.
>
> [Hayes, 1981, p.199]

This is interesting as it is well known that IQ tests are, generally, constructed on the principles of convergent thinking whereas creativity appears to emerge from a foundation of divergent thinking. Creative

> achievements ... result from an ability to think divergently, especially when a person is confronted with a novel problem solving task. Divergent thinking is important because it results in flexible, unusual, but generally useful solutions to problems.
>
> [Carr and Borkowski, 1987, p.40]

Creativity - The Need

In today's shrinking world, with its multitude of social and technological problems, "... there is a desperate need for the

creative behaviour of creative individuals" [Rogers, 1961, p.347], for "Man's greatest achievements are often the products of creative insights and intellectual skills" [Carr and Borkowski, 1987, p.40].

The need for a more holistic mode of thinking has already been detailed (see *Creativity and the Brain*, p.83/82) and Skromme (1988) points out quite dramatically the need for greater inventive ability in USA. Furthermore, as Skromme pointed out it is the creative person, not the person with a high IQ, who consistently provides the new ideas and the fresh insights which become tomorrow's newest inventions.

Today in USA, it is known "that creativity [is] one of the big strengths of minority/disadvantaged children" [Torrance, 1978, p.293], and it is highly probable that a similar situation exists in Australia, yet remarkably few children from minority cultures here are ever singled out for special nurturance.

The Creative Classroom

Walker (1986) stated that a healthy psychological climate was an essential for the growth of creativity. To accomplish this the first important factor is to foster cooperation. This can be done by following five main principles:

1. Instigate the use of group goals in all classroom activities. This means that each child is given work

appropriate to his/her ability which will contribute towards the completion of the activity or project. The students are then marked, if necessary, on the group's achievement and everyone helps everyone else because the ultimate goal is a group achievement.

2. At the beginning of the year it is important to negotiate rules and regulations so that students see that the order in which they live and work is self imposed and "owned" by them. In other words they have decided upon the rules and regulations in answer to a recognised need for order, therefore there should be little need for imposed authority and sanctions as such.
3. Many students have difficulty relating to their peers. The teacher should assist the successful integration of these children into the society of the classroom.
4. It is essential to reduce authoritarianism when teaching creative children. The teacher's language is modified to show that both the children *and* the teacher are to adopt the learning problems, that is, instead of saying "Your job today is to..." the teacher will say "Our problem today is to see if we can...", thus placing the teacher in the same camp as the children.
5. Active listening (Gordon, 1977) should be used, modelled and promoted within the classroom.

Thompson (1986) considers that a major factor in maintaining a healthy psychological climate is for the teacher to continue some form of personal development outside school hours. As Siegl (1986) states "Teachers must have strong egos and high self-esteem to permit children the necessities for creativity"

[p.18]. If teachers have no other form of evaluating their own work than through the efforts and achievements of the children they teach, the result is a loss of self esteem and an inability to retain the happy, relaxed atmosphere in which most children do their best work. However, if personal worth can be evaluated through personal development courses then the achievements of the students can remain separate from the achievements of the children and the teacher can remain pleased with children's output comparable with their age and expertise rather than expecting adult performance from students. Furthermore, the teacher remains in touch with the difficulties of the learning situation and can monitor more easily his/her own behaviours in front of the class (Thompson, 1986).

Walker (1986) states that a major factor needed for the ideally creative environment is a tolerance of diversity. The teacher should actively state, model and promote the idea that "Different is Dandy" or "Different is Delightful" to encourage children to accept and explore beyond their own narrow cultural confines. He also sees a wide access to a multitude of resources as a major factor in the development of the ideal environment for the promotion of creativity. For example, a child with potential in computer skills will never achieve that potential without access to a computer. Therefore, the classroom should be set up with as many hands-on work centres as possible. These should be colourful, stimulating and challenging so that the classroom environment is a happy and exciting place to inhabit.

Children should also be taught through a large number of excursions, how society operates and where to go for research resources.

As well as the need for resources and a healthy psychological climate, Dalton (in print) sees a fifth major factor concerned with instruction. She believes that wherever possible the accent should be on open endedness. In other words, children should not be taught that there is only one right answer to any question. Rather, they should be shown that all knowledge is accepted and used only until such time as someone comes along to disprove it or to find a better way of doing things.

She considers that as far as actual instruction is concerned, there are some issues which must be taught. It is important to teach children goal setting which is realistic and provides a good opportunity for their success. Successful achievement of personal goals is the most powerful activator of intrinsic motivation [Good and Brophy, 1987].

It is important to teach evaluation so that students are capable of effectively evaluating their own performance in a positive and reinforcing way.

Time-management is another important skill which should be taught as effective performance is often dependent on efficient time management. It also allows gifted students to take increasing responsibility for their own learning [Dalton, in print].

All children need to be taught how-to-learn skills. Although many very able students seem to pick them up for themselves, there are many children of above average ability and creativity who do not. The provision of these skills gives children a scaffolding by which they can structure learning and actualise potential. (See Morris and Stewart-Dore, 1984; Dalton, 1985; Clark, 1988; for How to Learn Skills.)

The use of mind maps for structuring concepts and a plan for structured problem solving such as Firestein and Treffinger's *Principles of Creative Problem Solving* (1983) should also be seen as essential instruction in schools.

When questioning students it is important that open-ended questions which promote thinking and invoke opinion, be used rather than closed questions which also seem to lead to closed or rigid minds.

When teaching, it is important for the teacher to model problem solving by verbalising whatever he/she is thinking; by talking the problem through in other words.

Lateral thinking (De Bono, 1967) is another particularly useful skill with which students should be equipped, to encourage them to both look at problems in different ways and look for different problems.

In all of these ways then, teachers can help children to become more creative and give creative children the tools they need to hone and discipline their skills to produce truly creative products.

For creative children autonomy is not just a demand, it is a deep-seated need. Without the right to work on the solution of the problem that stimulates them at the time, creative children become a prey to frustration and conflict. While still adhering to the demands of the Primary Curriculum it is possible to provide children with quite a high measure of autonomy by simply re-thinking and reorganising classroom instruction [Dalton, in print, 1987; Clark, 1988]. At secondary school level, the highly prescriptive nature of the curriculum and the time constraints imposed by this and the system of timetabling in most schools in Western Australia severely limit the level of autonomy which can be extended to students. It is quite feasible to assume that the limiting of autonomy, at a time when most adolescents are attempting to attain independence and identity is a considerable source of frustration and alienation in schools today.

Vygotsky insisted that "... social transaction is the fundamental vehicle of education..." [Bruner, 1985, p.25] and that therefore the mediation of learning by a significant adult is a critical factor in the knowledge acquisition of the child. As a baby or young child the significant adult is usually a parent and/or a member of the immediate family however, as the child grows older he/she is more likely to be a teacher or mentor. For creative children an empathetic informed parent and/or mentor becomes increasingly important. Teachers should actively attempt to match highly creative children with significant adults from the wider community who can operate as mentors over a significant time span.

Finally, Walker (1986) and Carroll and Howieson (unpublished), state that it is important to provide rewards and incentives for creativity. As explained elsewhere (see p.79/78) society produces whatever it values highly. In the author's opinion, creativity in Australia is not generally valued very highly, therefore those creative minds which do rise to the top, do so despite the value systems of our society rather than as a result of it [Skromme, 1988].

It does appear, that to as yet undefined limits, creativity is nurturable and trainable. The knowledge of how to do it is available but whether teachers will be motivated to operate these methods or whether the hidebound and conservative education systems of the times will permit them to do so is a whole new can of worms waiting to be opened.

Creativity Testing and Cultural Bias

> [Of] those groups concerned with the identification and development of giftedness ... almost everyone ... agrees that traditional identification tests, College Board Entrance Examinations, Graduate Record Examinations and the like are inappropriate for discovering giftedness among culturally different groups.
>
> [Torrance, 1977, p.3]

Thus any test formulated for testing individuals within one culture is likely to provide a level of bias if used to test individuals from another culture.

As late as 1982 the author observed a member of the WA Educational Guidance Branch testing a seven year old Aboriginal child with a WISC test to determine the placement or otherwise of the child in a "special" (i.e. educationally disabled) class. The WISC, with its weighting on the acquisition of middle class language skills, was a biased test for an Aboriginal child and its use was both a classic case of academic ignorance and a travesty of educational justice.

It should also be remembered that in the past a heavy weighting has been placed on the results of IQ tests when selecting gifted and talented children for special extension classes. Today, creativity tests are also being used a little more frequently than in the past, but creativity tests can be just as biased as intelligence tests [see the "Exploratory Study" detailed later] and selection of a test which is as free of bias as possible is in fact very difficult for several reasons:

- If there is to be intercultural validity then the instrument must test the same elements across all cultures. The difficulty is in ensuring that for one or more of the cultures tested, the instrument is not, in fact, testing something else, e.g. reading ability or language skills. Thus, the principal creativity test chosen needs to be language free as this is usually the major source of bias.

- The second factor involves the establishment of a satisfactory classroom atmosphere for testing. Hattie (1977, 1980) makes a strong case for administering creativity tests under test-like constraints. The problem here is that Hattie's work was conducted with non-Aboriginal children. Aboriginal children, on the other hand, have been shown to operate best in an untimed situation where the testing atmosphere is unpressured and relaxed [Kierans, 1976]. Quite obviously the problem here is how to achieve an affective domain which will at one and the same time provide the most accurate measure of creativity for the European children involved and still provide a pressure-free and relaxed atmosphere for the Aboriginal students. In other words, the need is to determine the form of test administration which will promote both optimal performance for both cultural groups and accuracy of measurement.

- The third factor, rapport, is also an element of the affective domain. For Aboriginal children, personal relationships are all important. Teachers who have failed to build warm relationships with their Aboriginal students will have little success in teaching them. Accordingly, to produce optimal test results in a testing situation, a healthy rapport with the Aboriginal children is needed. Kierans (1981) during a workshop, detailed a delightful anecdote regarding her attempts to establish a healthy rapport with the Aboriginal children prior to her testing. She explained that she first dressed in a simple cotton top, skirt and sandals and

then "just hung around the area where the kids were playing for a couple of days". She made no attempt to make contact with anyone but quite soon the Aboriginal children lost their shyness and came up to talk to her, to find out who she was, what she was doing there, where she lived, and so on. After a few days of close questioning from many children on issues such as "Was she married?", "Did she have any children?", "Did she have any relations in the area?", and so on, she was able to ask if anyone "would like to play a game with me?" and be assured of gaining a keen response. By adopting the approach used by the Aborigines themselves for approaching strangers, Kierans was considered to be extremely well mannered and her rapport with the children was high.

For any researcher going into a school to test in the confines of the classroom with a pen and paper test, some attempt must be made to get to know the children and allow them to know the tester before the work is commenced. Time spent sitting in the school yard during morning and lunch breaks can be most fruitful [Jocelyn Elphick, Primary Adviser, Aboriginal Education Branch, 1980, in private conversation]. Also, by joining the morning news session in the classroom, the research visitor is provided with an open forum where children can make early contact and begin to build relationships through question and answer.

- The fourth factor deals with the problem of ensuring that test administration instructions are properly understood by children from minority cultures. It has been said that approximately 50 to 80 percent of all interpersonal communication is non-verbal [Lee and Rubin, 1979]. As non-verbal language, or "body language" as it is popularly known, is also culture linked, it is important to ensure that any information which might be unconsciously transmitted on the non-verbal band is transmitted to all students, not just those who have picked it up because they chanced to be of the same cultural background as the researcher. Therefore, assistance from an ethnic adult with experience across both cultures would appear to be mandatory.

- Finally, the whole problem of cross cultural creativity assessment is further exacerbated by the "Catch-22" situation. To accurately assess the child's creativity it does seem necessary for the individual to produce some form of creative product, yet how can educators expect a child to produce the best product possible when cultural differences have prevented the individual from receiving the educational mediation necessary to do this?

The creativity section of the Literature Review dealt initially with the historical perspective and an examination of the development of the study of creativity. This was followed by an overview of the efforts of researchers to define creativity. Next, the creative person, the creative process, the creative

product and the creative environment were discussed. Recent information regarding creativity and the brain and creativity and intelligence were then detailed and this was followed by reference to the need for creativity in society. The section concluded with an examination of the ideal classroom for the development of creativity and a discussion of creativity testing and cultural bias.

CONCLUSIONS OF LITERARY REVIEW

At this stage it is important to examine the parallels which have emerged from the two sections of the review and to consider the implications of the relationships thus illustrated. The first factor deals with the ideal creative environment and this is probably best shown in the form of a table.

FIGURE 2:4

FACTOR	*CREATIVITY LITERATURE STATES:*	*ABORIGINAL CULTURE PROVIDES:*
1. Psychological climate	a) Need for ***peace*** in the land i.e. lack of stress (Kuo, 1987)	In most areas little need for open savage warfare due to low numbers and abundance of food therefore low stress. Majority of warfare, ritual. Today none.
	b) ***Freedom*** needed for person i.e. lack of stress - right to self-actualize (Kuo, 1987)	Conquest and enslavement not a feature of aboriginal culture. Dictatorship or repressive government unknown.
	c) Provision of ***autonomy*** necessary i.e. locus of control must be held by creative - right to be independent.	Fundamental value of Aboriginal society.
	d) ***Security*** necessary if person is to take risks.	Provided by i) the peer group ii) parental child rearing techniques.
	e) children need ***demonstrable human warmth*** if the psyche is to grow strong and healthy, needed particularly by the creative.	Provided by the peer group and multitude of aunts uncles and relations of the extended family.
2. Cultural Resources	A wide variety of ***resources*** needed to enable the creative to reach potential (Walker, 1986)	Huge catchment of spiritual and emotional resources available. Unfortunately, this is not visible to white society because it is not artifactual therefore potential for

FACTOR	*CREATIVITY LITERATURE STATES:*	*ABORIGINAL CULTURE PROVIDES:*
	In white society this tends to mean material resources but a measure of emotional resources is implied.	creative growth hard to quantify. Whatever was available in the way of concrete resources was shared but these were limited. Today often restricted due to poverty but concrete resources generally more readily available.
3. Mentors needed	Presence of significant adults necessary as empathetic mentors.	Provided by rich array of aunts, uncles and relations from extended family.
4. Incentives and Rewards	Considered necessary to show 'value' given to creativity, i.e. we produce only what we value.	A culture which sees no investment in change - no value seen in change therefore little value seen in creativity other than innovation in times of stress or creation of new spiritual products, e.g. song cycles or dances. However, acceptance readily given.
5. Tolerance for Diversity	Creativity cannot grow in a hidebound environment.	Little value seen in diversity and considerable subtle pressure to conform. However, a high degree of acceptance of non-conforming individual provided tribal taboos not broken.

As can be seen in the table (Figure 2:4), out of the five major environmental factors considered necessary for the growth of creativity, Aboriginal society provided three major factors, with an immense and highly significant investment in the area of psychological climate. There were few artifactual measures in traditional Aboriginal society and today these may still be limited due to poverty and isolation, however there was and seemingly still is in some areas a rich spiritual resource in Aboriginal society which may well be disregarded by "white" Australians as it is not understood (Christie, 1987). In the "white" mythology surrounding traditional Aboriginal culture, stories abound of Aboriginal operations within states of higher

consciousness, for example, mental telepathy and death by the "pointing-of-the-bone" ceremony. European understanding of phenomena such as these or Aboriginal 'dreaming' (Christie, 1987) remains at best, incomprehensive and at worst hostile, so there can be no measure of spiritual creativity.

Many researchers (Anderson, 1962; Taylor, 1963; Kuppner, 1968; Koestler, 1964) feel that the clue to the source of creativity lies in the operations of the right brain, which in most Europeans is far less well developed than the left brain (Clark, 1988, Grady and Luecke, 1978). Interestingly, although Aboriginal children may have difficulty with convergent cognition, they have displayed consistent superiority over European children in tasks demanding visual spatial knowledge (Kierans, 1976). This is a right brain operation so it seems sensible to assume that Aboriginal culture tends to develop the right brain to a greater degree than the left. It does not take a gigantic intellectual leap to suggest the possibility of a creativity element as another factor of that right brain development.

The third factor deals with the personality profile of the creative child. As previously stated, Perkins (1986) considers a personality profile to be a more reliable indicator of creativity than creativity testing. If one compares the profile of the archetypal creative child with that of the average Aboriginal child, the parallels are quite striking. The average Aboriginal child (Kierans, undated) is independent and highly autonomous, has a high degree of initiative and decision making skills, is impulse oriented, has the ability to concentrate for long periods if he/she is really interested in doing so, and is

perpetually curious. Add to this, highly developed observation/ perception skills and the assumption that the Aboriginal child must also be a creative child, becomes almost mandatory. Whether this assumption can be supported by documented evidence remains a question for research.

If evidence can be found to support this argument, it seems sensible to deduce that the reason for the heightened level of creativity must be the difference in child rearing practices. However, at this stage there will be no attempt made to provide evidence for the reasons for superior Aboriginal creativity. That will be left for a later study. The provision of clear support for the fact of creativity will be considered sufficient at this time. If it can be shown that Aboriginal children are highly creative, then by implication, more than simply the class management techniques must be examined. The entire curriculum used in the education of Aboriginal children will need searching inquiry and may need considerable revision.

This literature review was divided into two major sections, the Aboriginal Perspective and Creativity, in order to simplify and clarify for the reader an otherwise complex area of study. The first section dealt with the issues which seem to inhibit cognitive development for scholastic success, in minority and third world cultures in general and Aboriginal people in particular. It also considered the child rearing practices in a remote Aboriginal community and looked at the issues which seem to highlight the differences between Aboriginal and European child rearing practices, namely, ownership, development, socialisation and discipline.

The second section of the Literature Review was concerned with creativity. It looked at the historical perspective and the development of studies in the field. This was followed by an overview of the efforts of researchers to define creativity and then a consideration of the creative person, process, product and environment. Next came a discussion on creativity and the brain and creativity and intelligence which was followed by reference to the need of society for the nurturance of creativity. Then an overview of the creative classroom was provided and the section concluded with a discussion of creativity testing and cultural bias.

The Review as a whole concluded with a drawing together of similar themes from Aboriginal society and the Creativity literature. These were principally the themes of the ideal creative environment matched with the Aboriginal environment and the profile of the typical creative child matched with that of the average Aboriginal child. The suggestion was also made that while artifactual creative products are limited in Aboriginal society, the possibility remains that the majority of Aboriginal creative products were, or in traditional communities are, spiritual in nature, operating on higher planes of consciousness and therefore incomprehensible to European culture.

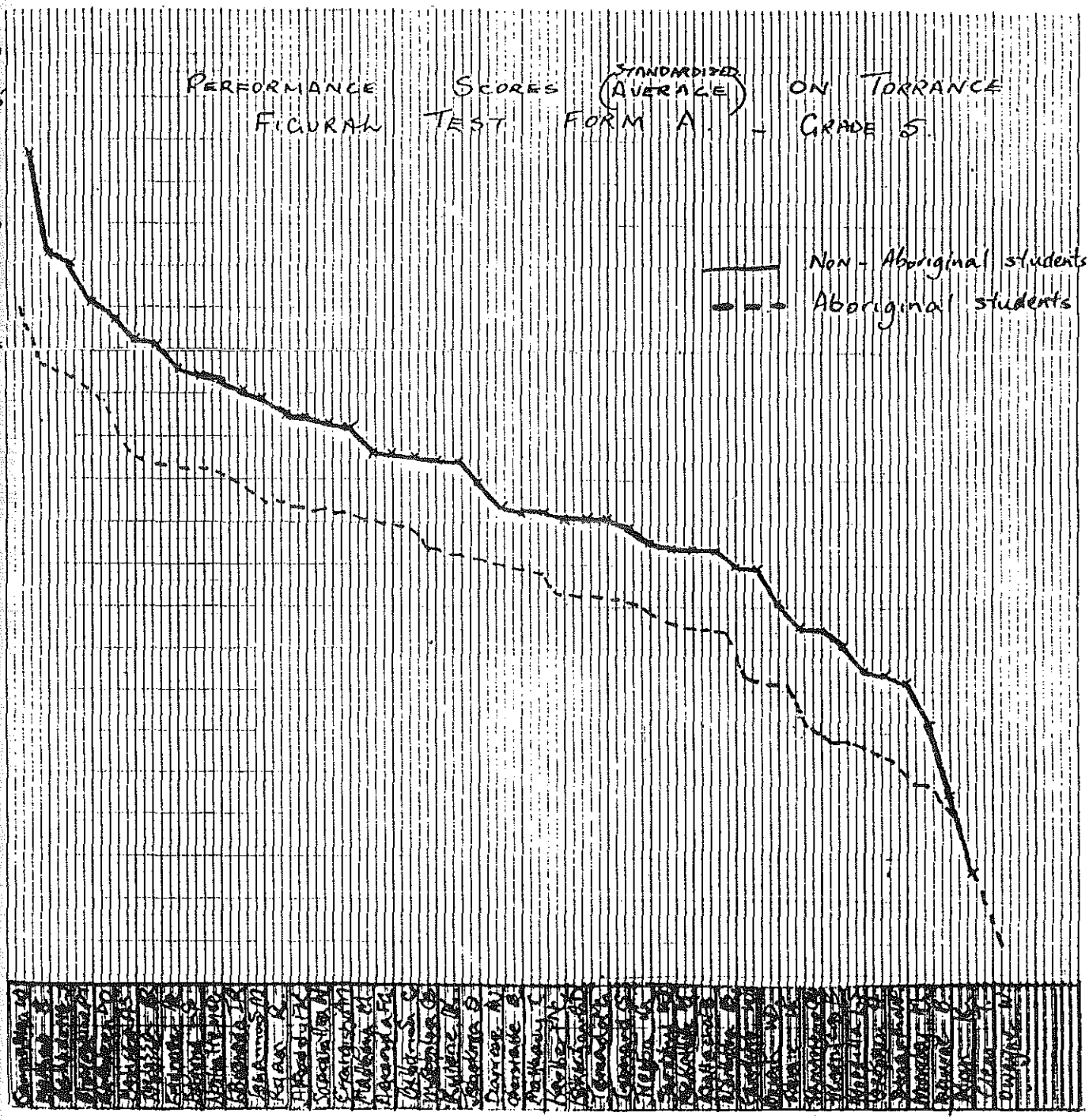
Finally it was mentioned that if support can be shown for the existence of superior creativity in Aboriginal children, then a close inspection and careful revision of both classroom management techniques and school curriculum will be needed in order to provide Aboriginal children with the optimal environment for scholastic success.

EXPLORATORY STUDY

In April 1989 an exploratory study of Aboriginal creativity was conducted in three schools in the Gascoyne area of Western Australia. The children selected for the study were all from Grade 5 classrooms. At Schools A and B all the Aboriginal children were included in the sample plus an equivalent number of non-Aboriginal children matched for sex, but chosen at random from the registers by the researcher, who had no inkling of their achievement or creativity levels. At School D all the Grade 5 children were tested but there were not enough non-Aboriginal students enrolled at the school to fully match the numbers of Aboriginal children. As a result, in all, 49 Aboriginal students were tested of whom 21 were males and 28 females; 44 non-Aboriginal students were tested comprising 18 males and 26 females.

Of the creativity tests available, it seemed that the ***Torrance Figural*** tests would have the least degree of cultural bias so the ***Figural A (1966)*** (see Appendix IV) was chosen to be the principal test. As such, it was the first administered to all groups, in the time slot between morning recess and lunch. In the remainder of the time available before lunch and in the session after lunch, three other tests were also given to see if the scores from these would support the results from the Torrance test. The other tests were:

FIGURE 3:1


PERFORMANCE SCORES (STANDARDIZED AVERAGE) ON TORRANCE
FIGURAL TEST FORM A. - GRADE 5.
Non-Aboriginal students
Aboriginal students
140
135
130
125
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35

- ***Alternate Uses*** - Form A by Paul R. Christensen, J.P. Guildford, Phillip R. Merrifield and Robert C. Wilson (1960) (See Appendix V)

- ***Making Objects*** - Form A by Sheldon Gardner, Arthur Gershon, Phillip R. Merrifield and J.P. Guildford (1963) (See Appendix VI)

- ***Match Problems*** - Form A by Raymond M. Berger and J.P. Guildford (1963) (See Appendix VII)

The Torrance Figural "A" tests were scored by the researcher using the Torrance Streamlined Scoring and Interpretation Guide. The results indicated that not only were Aboriginal children shown NOT to be creatively superior to "white" children, but in fact the opposite result occurred, and according to the results from Torrance's test, "white" children were shown to be clearly creatively superior to Aboriginal children (see Figure 3:1). The levels of ability were also distributed according to schools in quite an interesting way (see Figure 3:2).

TABLE 3:2

Torrance Figural A Test of Creativity

School	$\bar{x}$	*S.D.*	*Range*	*Median*
A	77.59	18.52	78.2	81.0
B	95.47	15.41	61.6	93.0
D	79.38	15.80	72.2	80.8

School B has produced a significantly superior mean and a narrower range than the other two schools. Of the students scoring the top fifteen averages of creativity based on standard scores, only five students were not from School B, and of these, all five were from School A. At the other end of the scale there were no School B students in the final fifteen and only four of the students were from School D, the rest being from School A. Before assuming that the students from School B are naturally more creative than students from elsewhere, it should be noted that School B has an art specialist and has had for three years, whereas the other two schools have not.

As with much research, more questions were raised than answered. Had the Aboriginal children done poorly because they did not fully understand the researcher's instructions which were given in standard English? Communication theorists suggest that between 50 to 80 percent of any transaction between human beings is passed non-verbally [Lee and Rubin, 1979]. Body language is, however, culture based, so perhaps part of the message was misunderstood by children who were trying to interpret the non-verbal signs across a cultural gap?

Next, one must ask, is the Torrance test as culturally unbiased as one might wish? In this test the Abstract Titles variable demands answers in words. If children are expected to operate in a language other than their first, surely it is possible that failure to come to terms with the language could cause poor marks on the abstract titles variable and thus affect the overall totals and averages of the standardised scores?

It is significant that thirteen Aboriginal children as opposed to only three non-Aboriginal children scored zero on the abstract titles scores. The results of one Aboriginal child which really highlight this possibility are as follows:

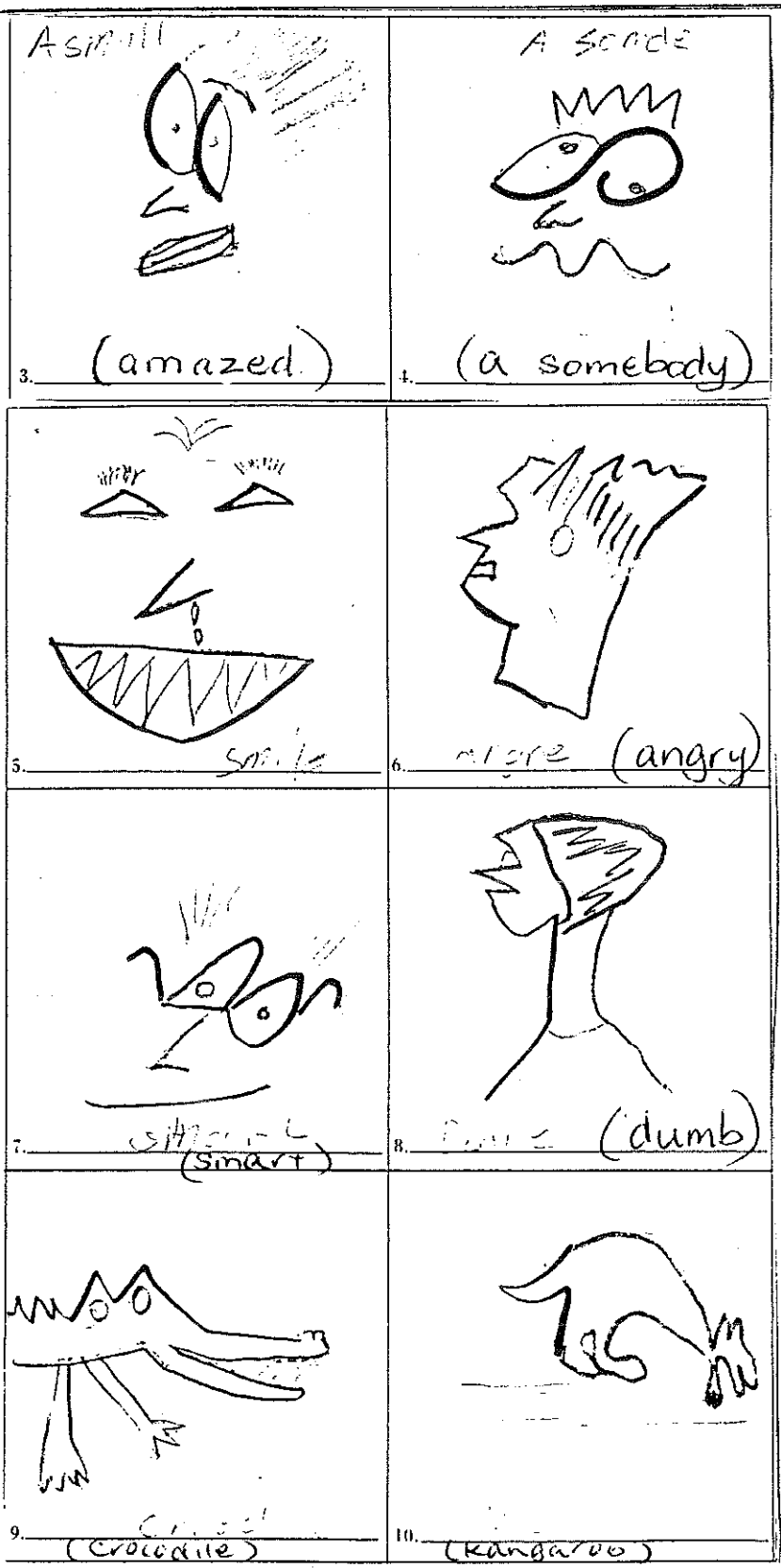
Variable	*Standardised Scores*
Fluency	127
Originality	123
Abstract Titles	0
Elaboration	50
Closure	60

After subjecting the Abstract Titles Variable to a one-tailed t test, the results indicated a significant difference between Aboriginal and white students with a probability level of .0306. The white students quite clearly performed better on this test than the Aboriginal children which would seem to support the idea of cultural bias on this variable at least.

The elaboration factor was another variable which concerned this researcher. "t" testing did not show any significant differences between Aboriginal and white children yet it seemed possible that truth may have been obscured by the effects of the test itself. To explain this further, a little digression is necessary.

Personal experience has led to the belief that Aboriginal people lean towards a restraint of expression rather than elaboration. In the past this was emphasised by an Aboriginal colleague who frequently ridiculed the amount of "talk" at education conferences with such statements as "Talk, talk, talk! You wadjalas! That's all you do, talk, talk, talk, and say nothing!" [O'Brien, 1982].

FIGURE 3:3



Brevity, yet power of expression in every line. This Aboriginal child from School D scored no points for originality for numbers 3 - 8 and few for elaboration overall - almost every line is essential - yet the creativity is obvious.

Aboriginal people appear to use non-verbal language for sending and receiving messages to a greater degree than Europeans.

Aboriginal students often have difficulty in fulfilling the word quotas when writing compositions because their story is related with the least number of words necessary to get the ideas across. On the other hand their ability to encapsulate ideas in just one or two words tends to produce a disproportionate number of children who are good at poetry. Unfortunately, experience as an advisory teacher has shown that because poetry writing tends to be given rather secondary importance in many schools, few teachers are aware of this area for potential excellence.

In the test several Aboriginal children provided drawings where this paucity of elaboration produced creatively powerful impressions. In Figure 3:3 there is brevity yet power of expression in every line. This Aboriginal child from School D scored no points for originality for numbers 3 to 8 and few for elaboration overall as almost every line is essential, yet the power of expression is obvious.

The Aboriginal child who produced the drawing in Figure 3:4 lives on the edge of the Gibson Desert where the annual rainfall is less than 10" per year. The paucity of elaboration means that the child scores poorly for creativity with this picture yet the overall impact is powerful and undoubtedly creative. The combination of brevity and power of expression appeared in the work of several Aboriginal children but did not appear at all in the work of non-Aboriginal children. The

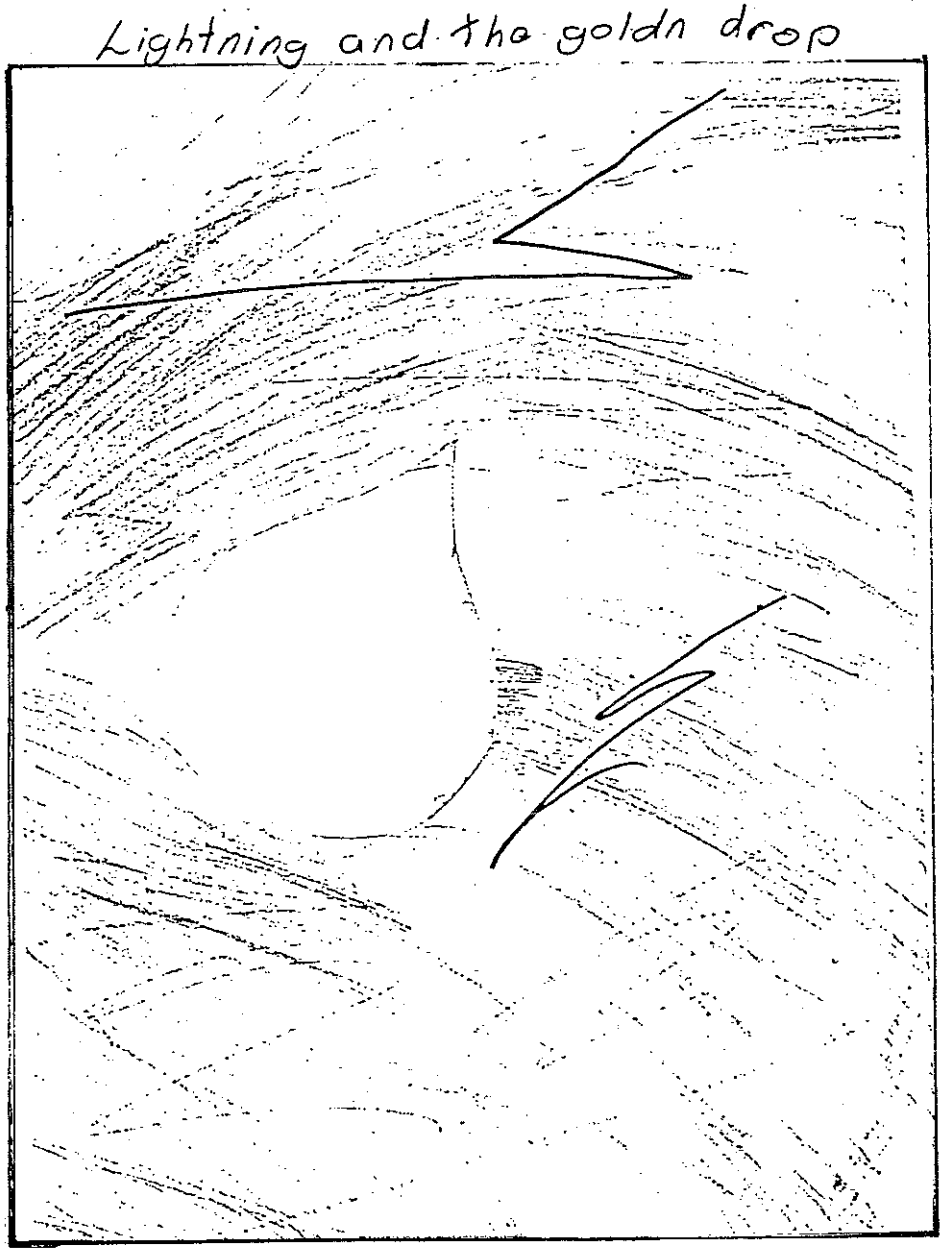
question therefore arose: Did Aboriginal children who scored poorly on the elaboration variable do so as a result of cultural influence while European children who scored badly did so because they simply were not creative?

Another factor which created concern was the time element built into the Torrance test. Kierans (1976) has shown that in visual memory exercises, Aboriginal children will frequently continue to produce correct responses after twenty minutes of concentration, ie. they will concentrate more than twice as long as non-Aboriginal children and expect to continue producing ideas. The Aboriginal children in particular found the time limits set on each section of test very frustrating - to the extent that pencils were thrown on the floor and loud comments made when time limits were reached before the children had completed things to their satisfaction. It seemed possible that the imposition of these time constraints disadvantaged many Aboriginal students.

By this stage, serious doubts had arisen regarding the supposed lack of bias of the Torrance figural test. The researcher began to wonder if the Torrance Figural A test was testing all forms of creativity or merely some elements of creativity? An Aboriginal child, from School A, was described by the school's music specialist, as the most musically creative child in the school, yet there was little indication of this in his overall average score on Torrance. It seemed possible to assume that aural creativity does not necessarily equate with visual creativity in which case the test does not measure "creativity" per se, it simply measures some elements of visual creativity.

FIGURE 3:4

An example of the difficulties involved in assessment of Aboriginal student's work on the Torrance Figural "A" Creativity Test.



The paucity of elaboration means that this Aboriginal child scores poorly for creativity with this picture. However, a knowledge of the importance of rain in this area which, being on the edge of the Great Sandy Desert, receives less than ten inches per year, provides the title with powerful impact.

It was also possible that the decision to use only the Figural test from the Torrance battery, in the interests of cultural non-bias, had resulted in skewed results related to the nature of creativity. In other words, the sort of creative behaviours peculiar to the lifestyle of a hunting-gathering economy may not actually have been measured at all.

There is considerable research evidence to show the significance of the testing conditions in influencing test performance (Baersma and O'Bryan, 1968; Smith and Bistocchi, 1983; Runco and Albert, 1985; Lissitz and Willhoft, 1985; Ziv, 1983). It is possible that despite efforts to the contrary, the researcher, being a stranger to the children, created a greater degree of anxiety among Aboriginal students, for whom human relationships are all important, than amongst non-Aboriginal students, thus affecting performance scores. In fact Lissitz and Willhoft [1985, p.10] even go so far as to say

> Our finding of the extreme sensitivity of the Torrance tests of Creative Thinking to experimenter-induced response sets leads us to conclude that even under conditions of rigorous control, studies using the Torrance Tests should be viewed with extreme caution. Not only may the results be antifactual, but the interpretation of creativity as a stable internal characteristic of a person is subject to suspicion.

It was obvious therefore that some other instrument was needed to continue research in this area. The new instruments needed to incorporate factors which would address the problems which

had arisen during the use of the Torrance Figural A and would also isolate the creative behaviours peculiar to a hunting and gathering economy.

THEORETICAL ASSERTIONS AND DERIVATION OF HYPOTHESES

Introduction

As indicated in the conclusion to the Literature Review, the elements of the Aboriginal child rearing environment and the desired environment for raising creative children, according to the literature, show striking parallels. Again, the personality profile typical of the creative child, as seen in the literature, shows much in common with the typical Aboriginal child. It would therefore seem that the typical Aboriginal child is indeed a creative child.

There can be little doubt that the Aboriginal child is a very independent and autonomous child, particularly so when compared with the average European child. If creativity is an element of this independence, it should be possible to ascertain the level of that creativity by testing.

If a high level of creativity can be established immediately the curriculum and management skills used in the education of Aboriginal children should be closely scrutinised as it has already been shown in the literature, that even for creative European children, that is, children of the prevailing culture, the curriculum is at best inadequate and at worst, soul destroying, while management techniques are all to often found to be authoritarian and repressive.

Purpose

The purpose of this research is to study the creativity of aboriginal children and its implications for learning and language teaching.

It is hoped that ultimately the research findings will provide some form of scientific basis for the demand for changes to curriculum and management in the education of Aboriginal children.

General Research Question

How do the levels of achievement of Aboriginal children compare with those of European children from the same socio economic and educational setting, on creativity measures and are these affected by time constraints?

Specific Study Questions

1a. How do the levels of creativity of Grade 5 rural-urban Aboriginal children compare with those of European children from the same socio-economic/educational setting when measured on the Test of Creative Thinking - Drawing Production (TCT-DP) by Urban and Jellen?

1b. How do the levels of creativity of Grade 5 traditional Aboriginal children compare with those of Grade 5 rural European children when measured on the TCT-DP test by Urban and Jellen?

1c. How do the levels of creativity of Grade 5 traditional Aboriginal children compare with those of Grade 5 rural-urban Aboriginal children when measured on the TCT-DP test by Urban and Jellen?

2. Is there a time influence in testing Aboriginal children's creativity on the TCT-DP test?

3. How do Aboriginal children compare with European children on the eleven sub-elements of the TCT-DP test?

4. Is there a significant difference between the mean Aboriginal creativity performance levels and the mean European creativity performance levels as measured on the Group Inventory for Finding (Creative) Talent (GIFT), by Sylvia Rimm (1976) - Upper Elementary Level?

5. How do teachers' perceptions of children's creative behaviours as measured by the Renzulli-Hartman Creativity Rating Scale (1971) correlate with the children's performances on the TCT-DP and GIFT tests?

Hypotheses

The specific research questions posed in the study provide the basis for the generation of the following null hypotheses:

H1.1 The mean performance level of Year 5 rural-urban Aboriginal children on the TCT-DP test will be significantly greater than the mean performance of rural-urban European children. $P < .05$

H1.2 The mean performance level of Year 5 traditional Aboriginal children on the TCT-DP test will be significantly greater than the mean performance of rural-urban European children. $P < .05$

H1.3 The mean performance level of Year 5 traditional Aboriginal children on the TCT-DP test will be significantly greater than the mean performance of rural-urban Aboriginal children. $P < .05$

H2.1 The performance of Year 5 rural-urban Aboriginal children in an untimed test situation will be significantly greater than the mean performance of rural-urban Aboriginal children in a timed test.

H2.2 There will be no significant difference in the mean performance of European children on a timed test when compared with those of an untimed test.

H2.3 The performance of Year 5 traditional Aboriginal children in an untimed test situation will be significantly greater than the mean performance of traditional Aboriginal children in a timed test.

H3.0 There will be a significant difference between the means of Aboriginal and European children with regard to the following components of the TCT-DP test:

i) Continuations

$\bar{x}$ Aboriginal > rural-Urban European = $P < .05$

ii) Completions

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

iii) New Elements

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

iv) Connections made with lines

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

v) Connections made that contribute to a theme

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

vi) Boundary-breaking being fragment dependent

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

vii) Boundary breaking being fragment independent

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

viii) Perspective

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

ix) Humour

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

x) Unconventionality

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

xi) Speed

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$

H4.0 The mean performance level of Aboriginal children on the GIFT test will be significantly greater than the mean performance of European children = $P < .05$.

There is a large body of knowledge attesting to the inability of teachers to identify gifted and talented children [Terman, 1926; Torrance, 1978; Maltby, 1984; Clark, 1988]. However, identification consists of two key concepts - the identification of specific behaviours and the intrepretation of these behaviours. In each of the references mentioned above, the failure of teachers lay in their interpretation of behaviours not their ability to identify them. As the Renzulli-Hartman Survey asks teachers only to identify behaviours, not interpret them, the results from this test instrument should be fairly reliable. Therefore, the following hypotheses are predicted.

H5.1 There will be a positive correlation between teachers' perceptions of traditional Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of traditional Aboriginal children as measured on the TCT-DR test.

H5.2 There will be a positive correlation between teachers' perceptions of rural-urban Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of rural-urban Aboriginal children as measured on the TCT-DP test.

H5.3 There will be a positive correlation between teachers' perceptions of rural-urban European children's creative

behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of rural-urban European children as measured on the TCT-DP test.

H5.4 There will be a positive correlation between teachers' perceptions of traditional Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of the same children on the GIFT test.

H5.5 There will be a positive correlation between teachers' perceptions of rural-urban Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Scale and the performance of the same children on the GIFT test.

H5.6 There will be a positive correlation between teachers' perceptions of rural-urban European children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of the same children on the GIFT test.

METHODOLOGY

The Population Sample

It was decided that the field study method was the method best suited to testing the main hypotheses of this research (Meyers and Grossman, 1974). Statistically speaking, Aborigines may represent almost two percent of the Australian population. They are scattered throughout suburban and rural areas but are usually only located in large numbers in the more remote areas. In order to obtain a large enough sample for testing it was necessary to travel extensively and visit six different schools.

The children selected for the survey were all from Grade 5 classrooms in state schools. They fell into three groups:

1. ***Rural Europeans***
2. ***Rural Aboriginal***
3. ***Traditional Aboriginal***

Rural European and Rural Aboriginal

The students comprising these two groups all came from state schools in the shire of Greenough, about 450 kilometres from Perth. Geraldton, its only large town, is actually an isolated

rural city of approximately 25,000 people, with a large, sprawling suburban area. Located on the coast, with large port facilities, it serves an extensive hinterland and is probably the fastest growing rural town in Western Australia. Schools A and B are both large Primary Schools (Grades 1-7) located in the residential areas surrounding Geraldton, while School C is a smaller primary school in the same area. School D is a District High School (Grades 1-10) located in a small rural town approximately 540 kilometres east/northeast of Geraldton on the edge of the Gibson Desert.

All the children from schools A, B and D who had been tested in the exploratory study and were present on the day of testing, were re-tested for the current study. In addition, any Aboriginal child new to the school, who was present on the day, plus a few extra European children chosen at random from the lists in order to boost the population sample numbers to 50, were also tested.

Due to the large numbers of rural Aboriginal children who were either absent from school or whose families had moved elsewhere, it was decided to test the Aboriginal children only from School C. Even with this addition, the numbers (38) were somewhat less than the target sample population of 50 for the rural Aboriginal group.

The majority of Aboriginal people in these areas live in standard Australian style (bungalow) homes and live in similar fashion to their non-Aboriginal neighbours. However, from discussion with Aboriginal adults and teacher observation of

mothers and children, it is believed that the child rearing behaviours have generally remained fairly true to those found in areas of traditional culture.

Traditional Aboriginal

Today there are really no Aboriginal people living a totally traditional lifestyle. All, to a greater or lesser degree have been affected by the dominant white culture. However, in the more remote areas in the far north and on the desert margins, there are communities where the people adhere as closely as possible to their traditional heritage.

Schools E and F are located in the Kimberley Region of Western Australia approximately 2,500 kilometres from Perth and 250 kilometres from one another. Both are District High Schools, though School E is smaller than School F. All the Aboriginal students in Grade 5 who were present on the day were tested. The children from these schools are actually from a variety of backgrounds though they have been designated as fitting into the traditional lifestyle group. Many do in fact live in camps outside the rural towns and "go walkabout" with their families once or twice a year. However, other children live in houses and have parents holding down responsible positions in the mainstream community.

The children to be tested in Schools A, B and D were all included in the exploratory testing in April 1989, however the children from Schools C, E and F had not previously been surveyed for creativity.

The Test Instruments

The test instruments chosen were twofold:

1. ***The Test of Creative Thinking*** - Drawing Production (TCT-DP) by Klaus K. Urban and Hans G. Jellen, 1984.
2. ***The Group Inventory for Finding Talent*** - (GIFT: Rimm, 1976; Rimm and Davis, 1980) Upper Elementary Level.

1. The TCT-DP test was chosen for several reasons:
   - The language component was minimal; it was not included in the timed part of the test and was provided verbally by the child so that no literacy skills were needed.
   - The time permitted for completion of the exercise appeared to be quite adequate, nevertheless it was decided to provide unlimited time for one half of each population group, thereby making provision for cultural differences in this area.
   - The TCT-DP had already been used across many different cultures in Europe and South America. It had also been used with "non-Aboriginal" Australians. The general consensus of opinion was that it did not appear to be culturally biased.
   - It would be very easy to administer and take up far less time than the Torrance Figural A Test.
   - It was a simple exercise for the children and the line fragments already on the paper meant that it was not as daunting a prospect as being presented with a blank page.

2. Because there is considerable support for the belief that personality inventories are good identifiers of creative and gifted children (Schaeffer, 1970, 1971; Renzulli and

The TCT-DP test was marked by this researcher according to the directions laid down in the manual but the GIFT tests were sent to America to be marked by the Educational Assessment Service. The Renzulli-Hartman Scale was also assessed by this researcher according to the directions given in Davis (1983). The score for each column was listed below it. The score for the strongly positive column was then multiplied by four; the score for the positive column by three; the score for the negative column by two; and for the strongly negative column by one. These weighted scores were then totalled and when referred to later in the data analysis will be known as the weighted total scores.

The possible range of scores lies between 10 and 40 with a score of 10 indicating a child with rigid thinking patterns, lacking the flexibility necessary for creativity. On the other hand, a score of 40 would indicate a highly creative child.

Analysis

The total scores from the TCT-DP test for each of the timed/ untimed groups from the three population samples were analysed using a "t" test to determine significant differences, if any, as a result of time.

The results from all three tests were then tested using a single classification Analysis of Variance (ANOVA) in order to discern the significant relationships, if any, according to the

hypotheses already stated. Duncan tests were performed to identify the differences between groups in each instance. Finally, the results from all three instruments were tested to ascertain the correlations, if any, between the three assessment instruments.

FINDINGS

This section deals with the findings of the three test instruments described in the Methodology chapter. These were the Renzulli-Hartman Creativity Rating Scale on which teachers assessed student behaviours according to a four point scale; the Urban and Jellen TCT-DP in which students extended line fragments on a piece of paper in order to complete a drawing, and the GIFT personal profile survey which was filled in by the children as each item was read aloud.

1. Renzulli-Hartman

The weighted total scores from this teacher designated behaviour profile were tested using the single classification, analysis of variance statistical procedure. The mean total scores for each of the three population samples - Rural European, Rural Aboriginal and Traditional Aboriginal - were compared for significant differences. A significant difference among the three means was found ($F=6.07$), $df=2.122$, $p=0.0031$). To test the difference between the groups a Duncan test was performed and this showed that although there was no significant difference between the Rural European (mean=23.347) and either of the Aboriginal groups, there was a significant difference ($P=<0.05$) between the Rural Aboriginal group and the Traditional Aboriginal group with means of 20.946 and 26.128 respectively.

2. Urban and Jellen: Test of Creative Thinking-Drawing Production (TCT-DP) 1984

a) ***Time***

"t" tests were run on the total scores of each of the paired groups (timed/untimed) from the three population samples to determine whether the element of time had produced any significant difference in the final results. In each case, however, the tests showed no significant difference. See Table 6:1 for results in this area.

TABLE 6:1

Variable: Total Scores TCT-DP

Group	Race	Time	Number	Mean	SD	t	Prob>:T:
1	E	*	24	18.96	6.79	-1.3872	0.1715
2	E	.	25	22.04	8.79		
3	RA	*	20	22.55	10.21	1.2351	0.2248
4	RA	.	18	19.05	6.65		
5	TA	*	20	18.60	5.91	-1.5297	0.1346
6	TA	.	19	21.80	7.28		

* Timed Group . Untimed Group

b) ***New Elements***

The scores of the variable New Elements for the children in each of the three groups, European (N=50), Rural Aboriginal (N=38) and Traditional Aboriginal (N=39), were analysed using an analysis of variance statistical procedure. A significant difference among the three means was found ($F=3.53$, $df=2,124$, $p=0.0324$). To test the difference between the groups a Duncan test was performed which showed a significant difference between the European group (Group 1) and the Traditional

Aboriginal group (Group 3), but no significant difference between either of these and the Rural Aboriginal group (Group 2). The respective means for each of these were 1.2, 2.308 and 1.658.

c) *Speed*

The variable speed was the only other variable from the TCT-DP test for which a significant difference was recorded. Again, the scores of the students in each of the three major groups, European (N=50), Rural Aboriginal (N=38) and Traditional Aboriginal (N=39) were analysed using the analysis of variance statistical procedure. A significant difference among the three means was found ($F=3.96$, $df=2,124$, $p=0.0216$). To identify the difference between the groups a Duncan test was performed which showed a significant difference between the European group (Group 1) and the Traditional Aboriginal group (Group 3) but no significant difference between either of these and the Rural Aboriginal group (Group 2). The respective means for these three groups were 0.920, 0.128 and 0.500. For a summary of this, see Table 6:2.

TABLE 6:2

Summary of information relating to the variables Speed and New Elements from the TCT-DP test after undergoing analysis using ANOVA and Duncan tests

Variable	*Population Sample*	*Race*	*Number*	*Mean*
New Elements	Group 1	E	50	1.200
	Group 2	RA	38	1.658
	Group 3	TA	39	2.308
Speed	Group 1	E	50	0.920
	Group 2	RA	38	0.500
	Group 3	TA	39	0.128

Of the eleven variables and the total scores on the TCT-DP test, Speed and New Elements were the only instances where significant differences were found.

3. Rimm: Group Inventory for Finding (Creative) Talent (GIFT) Upper Elementary Level 1984

The scores of the children in each of the three major groups, European (N=50), Rural Aboriginal (N=38) and Traditional Aboriginal (N=39), for each of the three variables of the GIFT test - Many Interests, Independence and Imagination - plus the total scores, were analysed during the analysis of variance statistical procedure. The results were as follows:

a) ***Many Interests*** - There was no significant difference shown between any of the groups on this variable.

b) ***Independence*** - A significant difference was found between the three means for this variable (F=7,59, df=2,123, p=0.0008). To identify the difference between the groups a Duncan test was performed and this showed that there was a significant difference between the European Group (Group 1 - 4.280) and both of the Aboriginal groups (Groups 2 and 3) - 2.842 and 3.289 respectively.

c) ***Imagination*** - For this variable also, a significant difference between the three means was found (F=5.82, df=2,123, p=0.0038). A Duncan test was performed in order to identify the differences between the groups. It showed no significant difference between the Aboriginal groups (Groups 2 and 3) but a significant difference could be seen between both of these and the European group (Group 1) with means of 3.368 (Rural Aboriginal), 3.105 (Traditional Aboriginal) and 4.280 respectively.

d) ***Total Scores*** - Once again a significant difference was found between the means of the three groups (F=6.49, df=2,123, p=0.0021). To identify the differences between the groups a Duncan test was performed which showed a significant difference between the European group (mean=20.600) and the two Aboriginal groups (Group 2 mean= 17.842, Group 3 mean=18.395). Once again, there was no significant difference between the two Aboriginal groups.

Prediction

The total scores for each of the three tests, Renzulli, TCT-DP and GIFT, were correlated to determine which, if either, of the two profiles, Renzulli or GIFT, would provide the best prediction of scores on the TCT-DP test. The results were interesting with a correlation of only r=-0.0534 between the Renzulli profile and the TCT-DP test; and r=0.2262 between the GIFT profile and TCT-DP. Furthermore, the correlation between the two profiles, one teacher designated, the other student selected, was only r=0.0871. There was therefore virtually no value, in either the Renzulli or the GIFT tests, as predictors of Creativity Scores gained on the TCT-DP test.

TABLE 6:3

Results of GIFT profile after analysis by ANOVA and Duncan tests

Group	*Independence*	*Imagination*	*Total Score*
1. European	4.280	4.280	20.600
2. Rural Aboriginal	2.842	3.368	17.842
3. Traditional Aboriginal	3.289	3.105	18.395

ANALYSIS OF FINDINGS:
ACCEPTANCE/REJECTION OF HYPOTHESES

The first specific study question asked how the levels of creativity of Grade 5 children, as assessed by the TCT-DP test by Urban and Jellen, compared, one with another, across the three population groups - rural European, rural Aboriginal and traditional Aboriginal.

The findings indicated that when the results were analysed using the single classification analysis of variance procedure (ANOVA), no significant differences were found in the mean performance of the three groups on the variable, total score. The acceptance/rejection of hypotheses tested in this research which were formed from the first specific study question are shown below.

H1.1 The mean performance level of Year 5 rural-urban Aboriginal children on the TCT-DP test will be significantly greater than the mean performance of rural-urban European children. $P < .05$ - Rejected, no significant difference.

H1.2 The mean performance level of Year 5 traditional Aboriginal children on the TCT-DP test will be significantly greater than the mean performance of rural-urban European children. $P < .05$ - Rejected, no significant difference.

H1.3 The mean performance level of Year 5 traditional Aboriginal children on the TCT-DP test will be significantly greater than the mean performance of rural-urban Aboriginal children. $P < .05$ - Rejected, no significant difference.

The second study question asked if there was a time influence in testing Aboriginal children's creativity on the TCT-DP test. After "t" tests were run on the total scores of each of the paired groups (timed/untimed) from the three population samples, the findings showed no significant differences as a result of the time element. However, it is considered that this was a result of the generous time allowance provided for the test rather than a conceptual fault. The acceptance/rejection of hypotheses formulated from this question is shown below.

H2.1 The performance of Year 5 rural-urban Aboriginal children in an untimed test situation will be significantly greater than the mean performance of rural-urban Aboriginal children in a timed test. - Rejected but test structure suspected as reason.

H2.2 There will be no significant difference in the mean performance of European children on a timed test when compared with those of an untimed test. - Accepted.

H2.3 The performance of Year 5 traditional Aboriginal children in an untimed test situation will be significantly greater than the mean performance of traditional Aboriginal children in a timed test. - Rejected but test structure suspect. See notes above.

The third specific study question asked how Aboriginal children compared with European children on the eleven sub-elements of the TCT-DP test.

When the results were analysed using single classification analysis of variance statistical procedure (ANOVA), the findings indicated that significant differences were found in only two variables - speed and new elements. As far as the results from the other nine variables were concerned, no significant differences were found.

The acceptance/rejection of hypotheses tested in this research which were formulated from the third study question are shown below.

H3.0 There will be a significant difference between the means of Aboriginal and European children with regard to the following components of the TCT-DP test:

i) Continuations

$\bar{x}$ Aboriginal > rural-Urban European = $P < .05$ - Rejected

ii) Completions

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

iii) New Elements

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Accepted

iv) Connections made with lines

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

v) Connections made that contribute to a theme

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

vi) Boundary-breaking being fragment dependent

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

vii) Boundary breaking being fragment independent

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

viii) Perspective

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

ix) Humour

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

x) Unconventionality

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Rejected

xi) Speed

$\bar{x}$ Aboriginal > rural-urban European = $P < .05$ - Accepted

The fourth study question asked if there were significant differences shown in the mean performance levels of European and Aboriginal children on the GIFT test. The findings, after an analysis of the results using the single classification

analysis of variance procedure, indicated that there was no significant difference between the two groups on the variable, Many Interests. However, on three other variables - Independence, Imagination and Total Scores - there was a significant difference, with the European group scoring clearly superior results over the Aboriginal children. Cultural bias is suspected on this test (see Discussion section).

H4.0 The mean performance level of Aboriginal children on the GIFT test will be significantly greater than the mean performance of European children = $P < .05$. - Rejected

The fifth and final specific study question asked how well teachers' perceptions of children's creative behaviours, as measured by the Renzulli-Hartman Creativity Rating Scale (1971) correlated with children's performances on the TCT-DP and GIFT tests.

After the total results of all three tests were analysed using the single classification analysis of variance statistical procedure (ANOVA), the findings indicated that the correlations between the two sets of test results and the Renzulli Scale were so low as to be virtually negligible.

The acceptance/rejection of hypotheses tested in this research which were generated from study question five are shown below.

H5.1 There will be a positive correlation between teachers' perceptions of traditional Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of traditional Aboriginal children as measured on the TCT-DP test. - Rejected

H5.2 There will be a positive correlation between teachers' perceptions of rural-urban Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of rural-urban Aboriginal children as measured on the TCT-DP test. - Rejected

H5.3 There will be a positive correlation between teachers' perceptions of rural-urban European children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of rural-urban European children as measured on the TCT-DP test. - Rejected

H5.4 There will be a positive correlation between teachers' perceptions of traditional Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of the same children on the GIFT test. - Rejected

H5.5 There will be a positive correlation between teachers' perceptions of rural-urban Aboriginal children's creative behaviours as measured on the Renzulli-Hartman Creativity

Scale and the performance of the same children on the GIFT test. - Rejected

H5.6 There will be a positive correlation between teachers' perceptions of rural-urban European children's creative behaviours as measured on the Renzulli-Hartman Creativity Rating Scale and the performance of the same children on the GIFT test. - Rejected

DISCUSSION OF FINDINGS

Renzulli-Hartman Profile

The results of this profile which indicated significant differences betwen Rural Aboriginal and Rural European children are rather interesting because they are contrary to initial predictions. One would expect the similarity of behaviours designated by teachers to have been between the two Aboriginal groups rather than the European and Traditional Aboriginal groups. There would appear to be two possible sets of explanations for this phenomenon.

(i) The first possibility is that as a result of a marked degree of cultural discontinuity due to the need to come to terms with the mainstream "white" culture in which they are immersed, Rural Aboriginal children have regressed to the stage where their scholastic behaviours have sunk below those of not only the European children but also those of the Traditional Aboriginal children. As this notion is not supported by their performance results on the TCT-DP test where no significant difference was found between the three groups overall, this explanation must be discarded as

inaccurate. The second possible explanation does seem far more probable when one considers the TCT-DP test results.

(ii) In the two schools from which the population sample for the Traditional Aboriginal group was drawn, there are usually only two or three white children in each class. It is suspected that, perhaps without even realising it, the teacher modifies his/her approach to classroom management, standards and curriculum to suit the majority, namely, the Aboriginal children. As a result there is little conflict and the teacher's perception of the children's behaviours is very positive. However, in the case of the Rural Aboriginal child, things are very different. To begin with, this group usually constitutes less than forty percent of the classroom population. The teacher tends to teach the majority and in doing so may make little concession to Aboriginality in his/her classroom management and standards. The competition and the drive for excellence which is a feature of the average European classroom would immediately put Aboriginal children offside and possibly create conflict. Thus, teachers would see the Rural Aboriginal children in a less positive light and possibly designate their behaviours in a more negative way, as much as anything because they are there operating beside the European norm.

The failure of the Renzulli-Hartman Rating Scale to predict student performance on the TCT-DP test was particularly interesting and raises several issues.

- The issue of teacher bias as described above.

- Another possibility is that the behaviours detailed by Renzulli and Hartman are not those which would give rise to the type of creativity tested by the TCT-DP. The Renzulli-Hartman Scale is intended merely to identify a creative child, not necessarily a visually creative child. On the other hand, the TCT-DP test, while it is quite obviously a test of visual/ graphic expression, is represented, like the Renzulli Scale, as an indicator of creativity per se, **NOT** of any specific form of creativity. However, at this stage the notion of a misfit of criteria between the two test instruments does seem sensible.

- Of course, the next question to be asked is, if the two test instruments are not testing the same thing, then which test is the more accurate test of creativity? It would seem that the instrument which has generated a creative product and shown itself to be almost free of bias must be the instrument selected and this would be the TCT-DP.

- Another possible reason for the lack of correlation is cultural difference. It is quite possible that the behaviours which are displayed by creative European children are not entirely the same as those displayed by creative Aboriginal children. It is feasible to assume that just as the creative product is culture bound, so too are its creator's behaviours. There are some items on the Renzulli Scale which support this notion. Item five includes "... imagines ("I wonder what would happen if...?)". The Aborigines are a pragmatic people and the usual response to this sort of question by an Aboriginal child is a flat "It couldn't happen!".

Teachers who have frequently received this sort of response could not rate the Aboriginal child highly on item five. Item 9 states "... is individualist; does not fear being different". For an Aboriginal, these two points are not synonymous. Again, in item ten, the two descriptors may well be at odds when applied to Aboriginal children. Item 10 states "Criticizes constructively; is unwilling to accept authoritarian pronouncements without critical examination". While the latter statement is highly applicable, it is unlikely that a traditional Aboriginal child would criticize a statement from a teacher unless it was something to do with the child's world. The rules of politeness to adults would prevent the child from saying much, if anything. Thus, cultural bias can be alleged as a reason for the lack of correlation between the Renzulli-Hartman Scale and the Aboriginal children's scores on the TCT-DP test.

- This does not of course explain the lack of correlation between the two sets of scores for the European population sample. Therefore, one must ask, are the descriptors included in each item of the Renzulli test at fault? In other words, is it possible that the descriptors in e.g. item nine, could be incongruent? Item nine reads, "Is nonconforming; accepts disorder; is not interested in details; is individualistic; does not fear being different". It would seem possible that a child could accept disorder yet be very interested in details or could be uninterested in details, yet fear being different. In cases like this teachers could have difficulty deciding how to rate children on the scale.

Finally, it seems possible that all of these factors - a mismatch of criteria, cultural bias and the wording of the descriptors in each item of the Renzulli-Hartman Scale - could all have contributed to its failure to accurately predict the scores of the children on the TCT-DP.

Test of Creative Thinking (TCT-DP)

1. Time

The first variable considered here was time which showed no significant difference between either of the groups in each population sample or between the population samples. It is suspected that this was a direct result of the generous amount of time (fifteen minutes) provided in the TCT-DP test for completion of the exercise. In only one instance did a child in a timed group object to being asked to finish the drawing "in the next one or two minutes" and that child was not an Aboriginal student.

One interesting feature from the tester's point of view was the difference in the amount of time spent in the planning stage. It was quite noticeable that whereas most European children started their drawings within the first two minutes of the session, the children in the Kimberley schools (Traditional

Aboriginal children) spent a great deal more time thinking about what they were going to draw before putting pen to paper. This is borne out in the results from the variable, Speed.

2. Speed

The children's results on this variable should be examined with care because marks for speed were only given if a student had amassed a score of 25+ over the previous ten variables. Therefore there were students who finished very quickly but did not earn points for speed because their work was not sufficiently creative to score 25 points or more over the first ten variables. Nevertheless, from a purely subjective point of view, the results do seem to bear out the observations made during administration.

3. New Elements

That the only drawing element of the TCT-DP test for which any significant difference could be found was New Elements and that the highest means earned were achieved by Aboriginal children, does seem quite significant. Admittedly, there is not a sufficient difference between the European (1.200) and Rural Aboriginal (1.658) means to be significant, but the trend is clear. It would seem that by the insertion of New Elements in the exercise, Aboriginal, particularly Traditional Aboriginal, children are showing a creative need to invent their own reality, whereas by simply integrating the elements presented, the European students are showing a passive acceptance of what is present with the implication that these can be manipulated

but not transformed. Surely the significantly higher score on the variable of New Elements must be an indicator of differences in creativity and the obstacle which continues to beset one, is again the lack of an adequate test, free of cultural bias, with which one could come to grips with something more definite than an *indication* of creativity.

The one thing which does seem clear is that the TCT-DP test is less biased for Aboriginal children than the Torrance Figural A. The only other reason for the lack of significant difference in mean total scores between the "white" and the Aboriginal component could be that the Aboriginal children felt more confident and assured because they knew and recognised the researcher, therefore they performed better. While it is true that for Aboriginal children the bond between student and teacher is all important if learning is to take place, it would be unlikely that one sighting, six months previously, would be sufficient to provide such a marked difference in test results.

GIFT Profile

As the GIFT test is American; has shown little correlation with the TCT-DP drawing test and produced some unexpected findings, one wonders just how much credence can be given to its results which remain questionable. The significantly superior

performance of European children on two out of the three variables and the total score plus the fact that it is a verbal inventory, immediately causes one to suspect cultural bias in favour of the European students.

An examination of the test itself provides several instances of statements which would not be well received by Aboriginal children. Although these children are autonomous and highly independent, the peer group is of considerable importance, therefore they like to have their friends at least in the vicinity, even while happily "doing their own thing" quite separately from the other children in the locality. Thus, statements such as "I like to take walks alone" (Item 2), "I like to have only one or two friends" (Item 6), "I always like to play with friends but never alone" (Item 23), "I would go to a new place only if I knew someone else who was going there" (Item 26) and "I would like to try going to a different school for a while" (Item 30) which would indicate independence in a European child, are not good benchmarks in eliciting information regarding independence from an Aboriginal child. As the fundamental value of Aboriginal society is the depth of one's relationships with other human beings, independence Aboriginal style tends to mean independence of thought despite physical proximity rather than independence as a result of physical distance. The issue underlying all this is that Aboriginal children are answering the same questions but from a totally different viewpoint from the European children so the test results must remain questionable at best. Certainly, for anyone who has worked with both European and Aboriginal children the idea that the former are more independent than the latter, as

is indicated by the Independence variable on the GIFT test, is truly ridiculous.

Conclusions

As so often happens in the realm of cross-cultural assessment, the results are inconclusive. The Renzulli-Hartman profile indicated that Traditional Aboriginal students were rated as being more creative than either of the other two groups. The expectation was that the Rural Aboriginal children would achieve the next highest score, but this was not so. This group scored the most poorly on the profile, though attempts have been made to explain the phenomenon.

Support for these indicators of creativity was then looked for in the performance scores on the eleven variables and the total scores gained on the TCT-DP test. Out of the twelve variables significant differences were found in only two cases - New Elements and Speed. On the New Elements test the highest scoring group as once again the Traditional Aboriginal group, followed by the Rural Aboriginal group and finally the European group. On the variable Speed, the European group worked faster than the Rural Aboriginal group, while the Traditional Aboriginal children scored the lowest marks. Observation during administration indicated that Aboriginal, specifically Traditional Aboriginal children, took noticeably more time during the planning stage, sometimes taking as much as six to seven minutes before putting pen to paper. As this behaviour has previously

been noted as typical behaviour for creative people, it would appear that the data from both variables has provided further support for a belief in Aboriginal creativity by supporting hypotheses H3:3 and H3:11.

Of the three measures, the GIFT test appears to have been the least helpful and its results the most suspect. This would almost certainly be due to the fact that it is a verbal test and even though the test was read aloud, the Aboriginal children had to interpret meaning and make decisions based on those interpretations. As they were undoubtedly operating from a different cultural viewpoint, inaccuracies were almost bound to occur. With hindsight it is possible to see now that this test was a poor choice. The problem here lies in the failure of the GIFT to correlate highly with and support the results of the TCT-DP.

It has not been shown conclusively in this research that Aboriginal children are creatively superior to European children. However, it may still be appropriate for teachers of Aboriginal children to adopt as many as possible of the management techniques and curriculum suggestions detailed in "The Creative Classroom".

As creativity, by its very nature, is a constructive process, the creativity indicators should provide further support for the proponents of language experience as the most favourable method of literacy instruction for young Aboriginal children. This method teaches reading using the child's own language and constructionist rather than reductionist approaches which would

seem to be far more consistent with the findings of this study than the rote and convergent phonic or "look and say" methods. The study certainly did seem to indicate that Aboriginal children showed a greater willingness than European children to use new elements, a characteristic which would be used in a language experience model [Sloan and Lathom, 1981]. By using these approaches which allow Aboriginal children to make use of their background knowledge,styles, linguistic structures and affective responses, it may be possible to provide them with the skills required in a literate society without the confrontation or resentment which come from the use of methods and materials which do not sit comfortably with the Aboriginal cultural heritage.

Suggestions For Further Study

If creativity is seen as the sum total of a person's unique spiritual, perceptive and emotional qualities, honed by intelligence and directed by will to produce original ideas or artifacts of high quality, which will significantly affect and/or reflect the human condition in a positive way, then it becomes obvious that any test of creativity must be culture specific. Until such time as a test has been formulated which is appropriate to the value systems, thought processes and mores of hunting gathering societies and specifically Australian Aboriginal culture, it is unlikely that the identification of creative Aboriginal children can be more than a hit and miss procedure at best. The need for a better test is clear and it would provide a particularly worthwhile area for further research.

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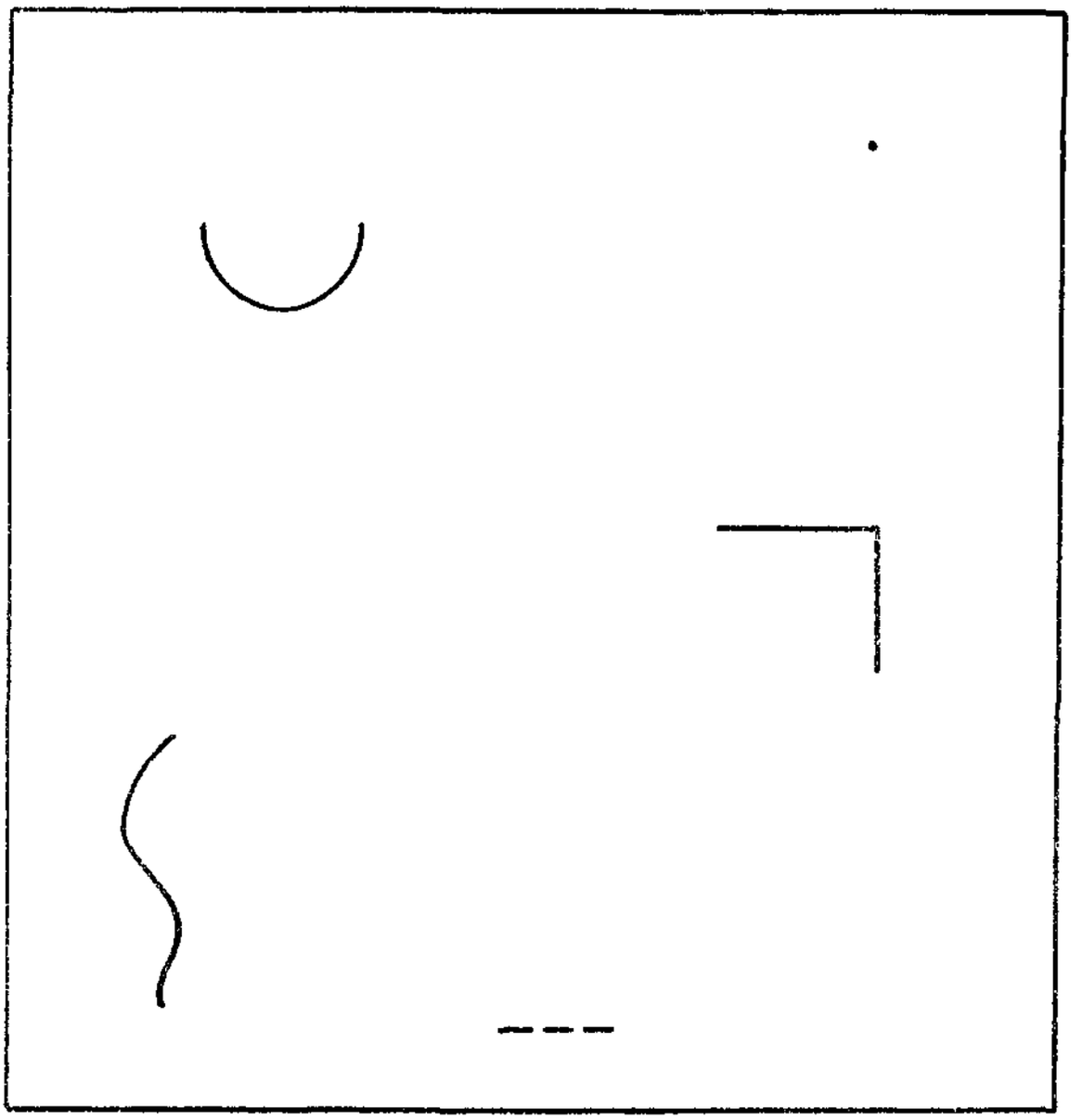

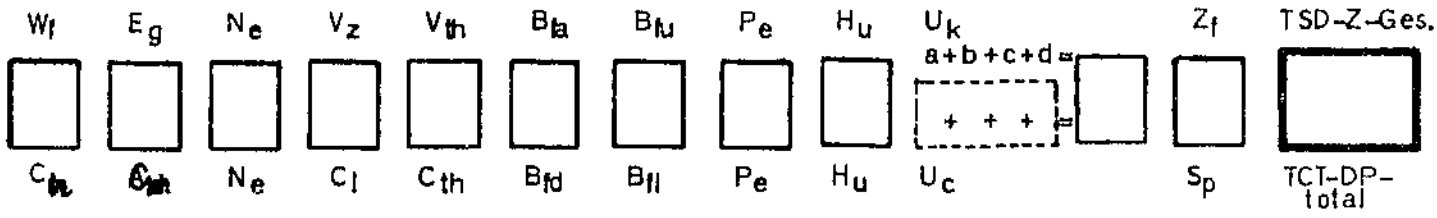
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23. I always like to play with friends, but never alone.	Yes ○	No ○
24. I have many hobbies.	Yes ○	No ○
25. Playing make believe games seems babyish.	Yes ○	No ○
26. I would go to a new place only if I knew someone else who was going there.	Yes ○	No ○
27. I often wonder what makes me dream.	Yes ○	No ○
28. I like to do my own science experiments.	Yes ○	No ○
29. I like to read books about the future.	Yes ○	No ○
30. I would like to try going to a different school for a while.	Yes ○	No ○
31. I can work on my hobby for a long time and not get bored.	Yes ○	No ○
32. Almost all my friends are in the same grade as I am.	Yes ○	No ○
33. I'm a lot like most of my friends.	Yes ○	No ○

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DATE _____ GRADE _____

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Read each sentence below. Fill in the circle in the YES column next to each sentence if you agree with it and in the NO column if you don't agree. If you're not sure if you agree or not or think you sometimes agree, fill in the answer which is closest to the way you feel. There are no right or wrong answers. We only want to know how you think and how you feel about things, and what you like to do.

	Yes	No
1. I like to make up my own songs.	○	○
2. I like to take walks alone.	○	○
3. My mom or dad like to play with me.	○	○
4. I ask a lot of questions.	○	○
5. Making up stories is a waste of time.	○	○
6. I like to have only one or two friends.	○	○
7. I like to hear stories about life in other countries.	○	○
8. It's all right to sometimes change the rules of a game.	○	○
9. I have some really good ideas.	○	○
10. I like to paint pictures.	○	○
11. I like things that are hard to do.	○	○
12. A picture of the sun should always be colored yellow.	○	○
13. I like to take things apart to see how they work.	○	○
14. I'd rather color or paint in a coloring book than make my own pictures.	○	○
15. Easy puzzles are the most fun.	○	○
16. Sometimes my mom or dad and I make things together.	○	○
17. I like to learn about animals.	○	○
18. I wish other children wouldn't ask so many questions.	○	○
19. It's hard to find things to do when I'm alone.	○	○
20. I like stories of long ago.	○	○
21. I would rather play old games than new ones.	○	○
22. When something I want to do gets hard I give up and try something else.	○	○

over

Renzulli-Hartman Scale

	1	2	3	4
1. Displays a great deal of curiosity about many things; is constantly asking questions about anything and everything.	—	—	—	—
2. Generates a large number of ideas or solutions to problems and questions; often offers unusual ("way out"), unique, clever responses.	—	—	—	—
3. Is uninhibited in expressions of opinion; is sometimes radical and spirited in disagreement; is tenacious.	—	—	—	—
4. Is a high risk taker; is adventurous and speculative.	—	—	—	—
5. Displays a good deal of intellectual playfulness; fantasizes; imagines ("I wonder what would happen if . . . "); manipulates ideas (i.e., changes, elaborates upon them); is often concerned with adapting, improving and modifying institutions, objects, and systems.	—	—	—	—
6. Displays a keen sense of humor and sees humor in situations that may not appear to be humorous to others.	—	—	—	—
7. Is unusually aware of his impulses and more open to the irrational in himself (freer expression of feminine interest for boys, greater than usual amount of independence for girls); shows emotional sensitivity.	—	—	—	—
8. Is sensitive to beauty; attends to aesthetic characteristics of things.	—	—	—	—
9. Is nonconforming; accepts disorder; is not interested in details; is individualistic; does not fear being different.	—	—	—	—
10. Criticizes constructively; is unwilling to accept authoritarian pronouncements without critical examination.	—	—	—	—
Column Total	—	—	—	—
Weight	1	2	3	4
Weighted Column Total	—	—	—	—
Total				____

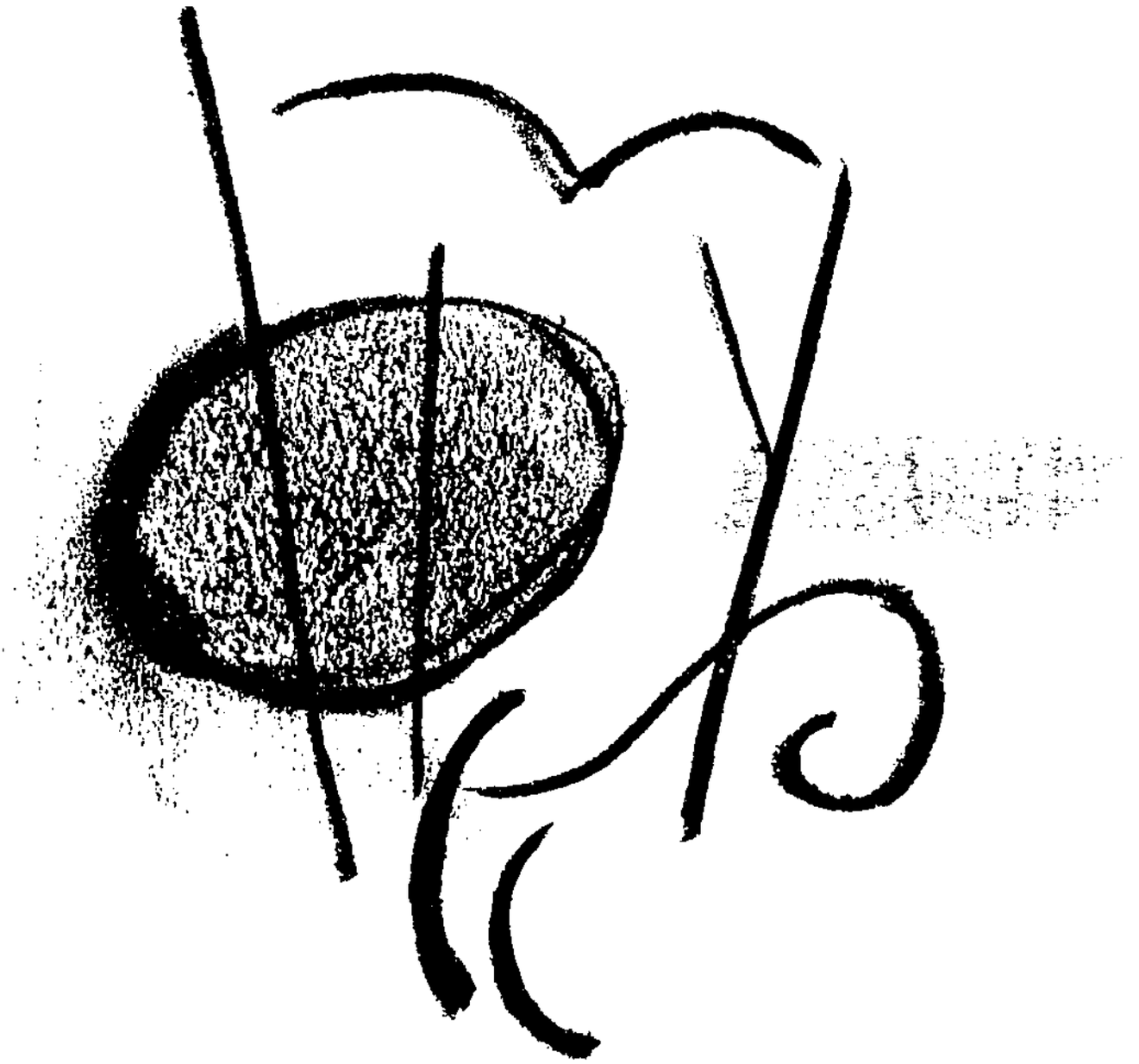
Thinking Creatively With Pictures

By E. Paul Torrance

Booklet A

Name _____ Age _____ Sex _____ Grade _____

School _____ City _____ Date _____



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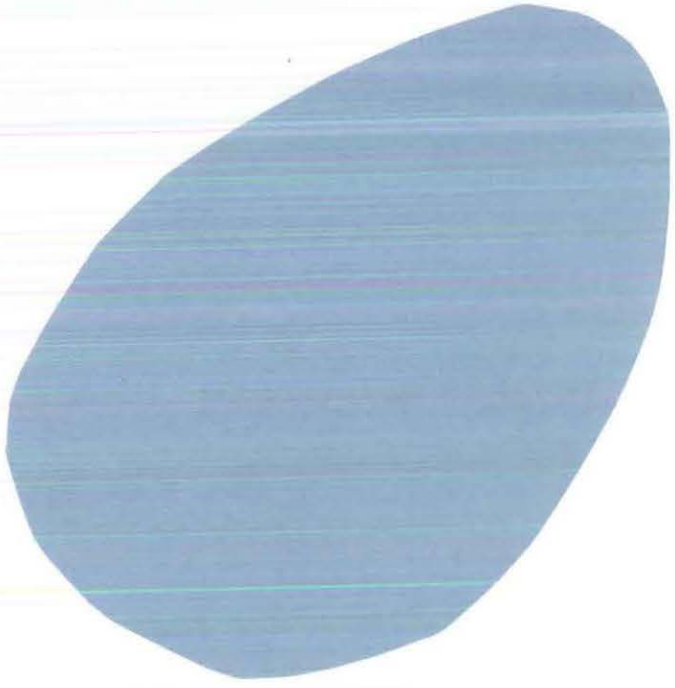
Activity 1. PICTURE CONSTRUCTION

Below is a piece of colored paper in the form of a curved shape. Think of a picture or an object which you can draw with this piece of paper as a part. On the back of these shapes you will find a thin layer of paper that can be peeled away. Look. Now you can stick your colored shape wherever you want it to make the picture you have in mind. Stick yours on the next page where you want it and press down on it. Then add lines with your pencil or crayon to make your picture.

Try to think of a picture that no one else will think of. Keep adding new ideas to your first idea to make it tell as interesting and as exciting a story as you can.

When you have completed your picture, think up a name or title for it and write it at the bottom of the page in the space provided. Make your title as clever and unusual as possible. Use it to help tell your story.



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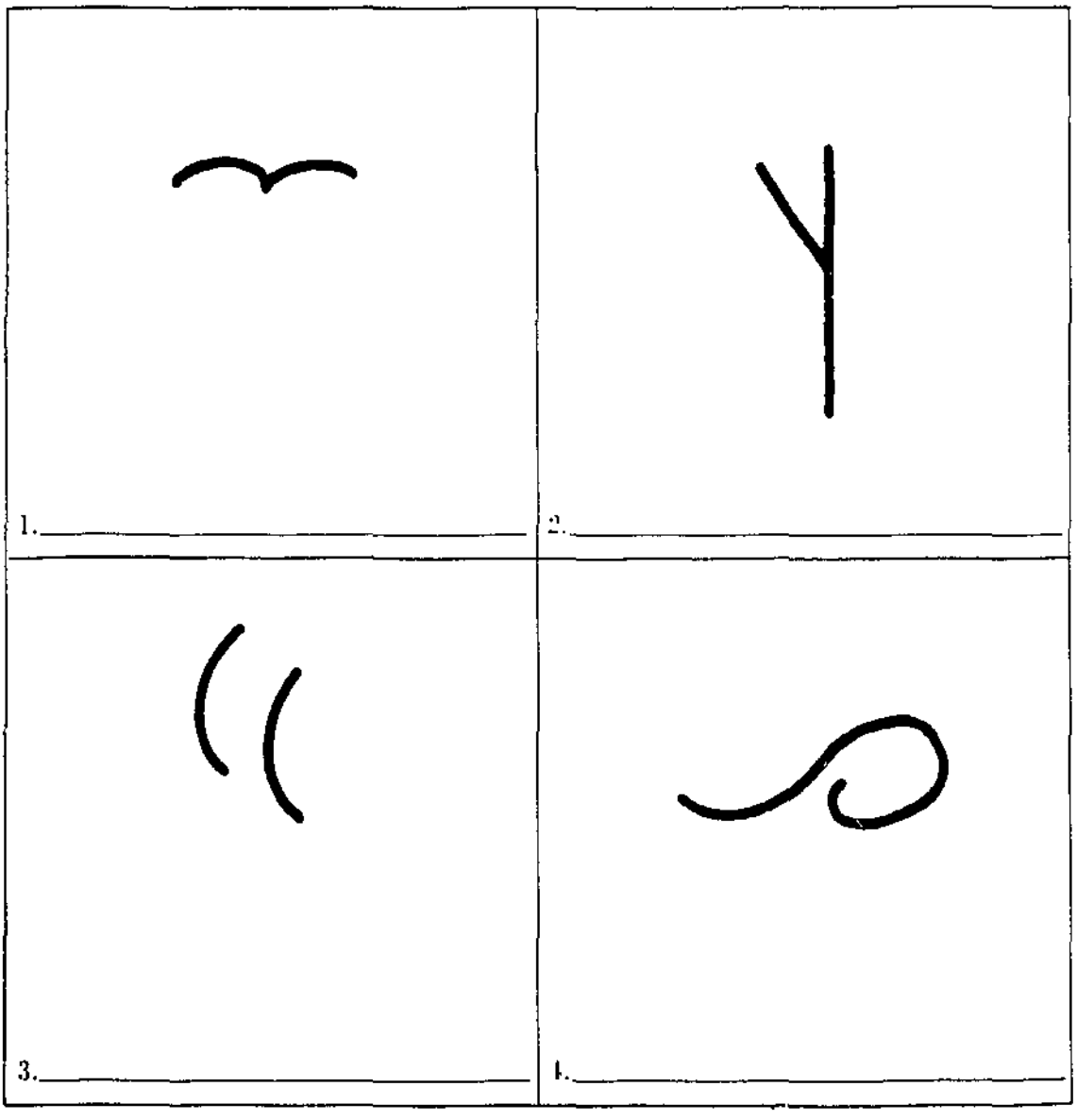
YOUR TITLE:_____

Activity 2. PICTURE COMPLETION

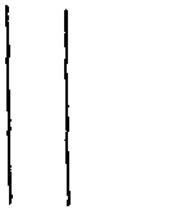
By adding lines to the incomplete figures on this and the next page, you can sketch some interesting objects or pictures. Again, try to think of some picture or object that no one else will think of. Try to make it tell as complete and as interesting a story as you can by adding to and building up your first idea. Make up an interesting title for each of your drawings and write it at the bottom of each block next to the number of the figure.



5. 	6. 
7. 	8. 
9. 	10. 

Activity 3. LINES

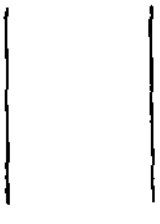
In ten minutes see how many objects or pictures you can make from the pairs of straight lines below and on the next two pages. The pairs of straight lines should be the main part of whatever you make. With pencil or crayon add lines to the pairs of lines to complete your picture. You can place marks between the lines, on the lines, and outside the lines—wherever you want to in order to make your picture. Try to think of things that no one else will think of. Make as many different pictures or objects as you can and put as many ideas as you can in each one. Make them tell as complete and as interesting a story as you can. Add names or titles in the spaces provided.



1._____

2._____

3._____



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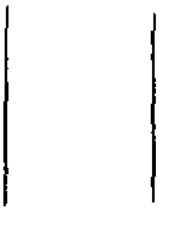

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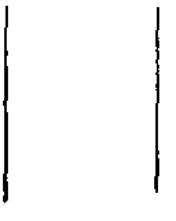

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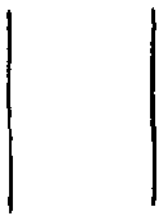

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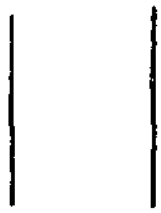

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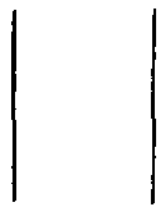

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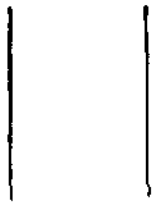

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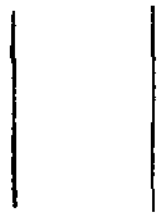

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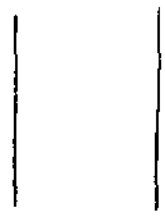

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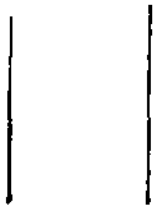

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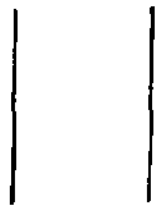

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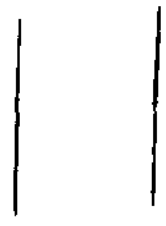

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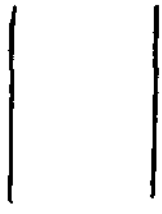

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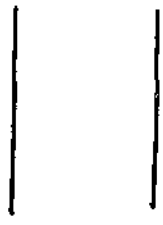

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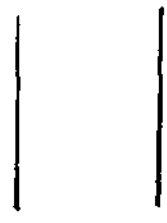

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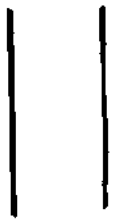
GO ON TO NEXT PAGE

19. 

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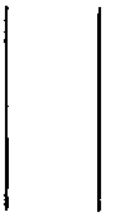
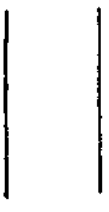
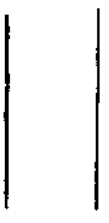
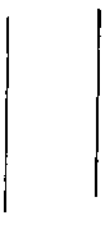
21. 

22. 

23. 

24. 

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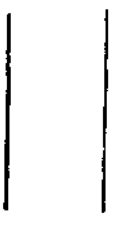
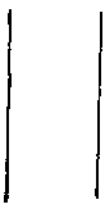
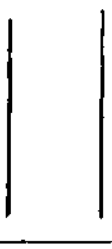
26. 

27. 

28. 

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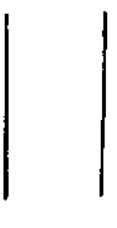
30. 

ALTERNATE USES

Form A

Paul R. Christensen, J. P. Guilford, Philip R. Merrifield and Robert C. Wilson

NAME _____ SEX: M ____ F ____ SCORES: I ____ II ____ III ____ Total ____

GROUP _____ DATE _____

In this test, you will be asked to consider some common objects. Each object has a common use, which will be stated. You are to list as many as six other uses for which the object or parts of the object could serve.

EXAMPLE:

Given: A NEWSPAPER (used for reading). You might think of the following other uses for a newspaper.

a. start a fire
b. wrap garbage
c. swat flies
d. stuffing to pack boxes
e. line drawers or shelves
f. make up a kidnap note

Notice that all of the uses listed are different from each other and different from the primary use of a newspaper. Each acceptable use must be different from others and from the common use.

Do not spend too much time on any one item. Write down those uses that occur to you and go on to the others in the same Part. You may return to the incomplete items in a Part if time for that Part permits.

There are three parts to this test, with three items per part. You will have 4 minutes for each part.

If you have any questions, ask them now.

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

PART I

List as many as six possible uses for each of the following objects:

1. SHOE (used as footwear)

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

2. BUTTON (used to fasten things)

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

3. KEY (used to start a car)

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

PART II

List as many as six possible uses for each of the following objects:

4. CHAIR (used for sitting)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

5. WATCH (used for telling time)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

6. SAFETY PIN (used for fastening)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

PART III

List as many as six possible uses for each of the following objects:

7. WOODEN PENCIL (used for writing)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

8. A CAR OR TRUCK TYRE (used on the wheel of a car)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

9. GLASSES (used to help you to see)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

MAKING OBJECTS

Form A

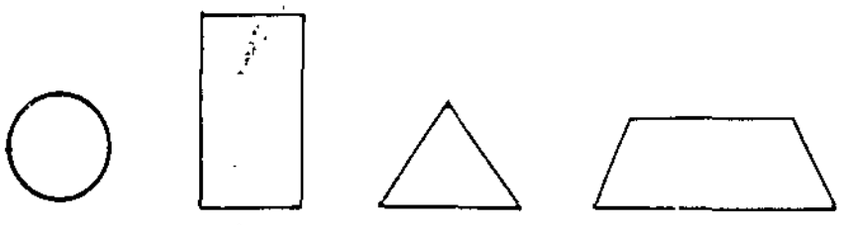
Sheldon Gardner, Arthur Gershon, Phillip R. Merrifield, and J. P. Guilford

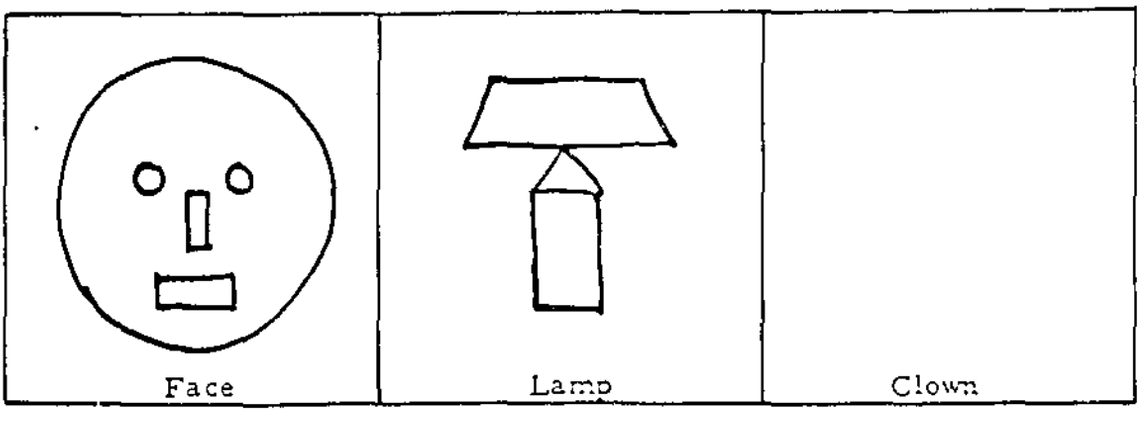
NAME _____ SEX M ___ Scores: I _____
(Print) Last First Middle F ___ II _____
III _____
GROUP _____ DATE _____ Total _____

In this test you will be given some simple figures. You are to combine some of the figures to make certain objects. Follow these rules:

1. You may use only the given figures; do not add any other lines.
2. You may change the size or position of any given figure, but NOT its shape.
3. You may use a figure more than once in making the same object.
4. You do not need to use all the figures in the same object, but use more than one.

For example, given these simple figures, make the objects named in the squares.





Notice that only a and b were used in making this face.

b, c, and d were used here.

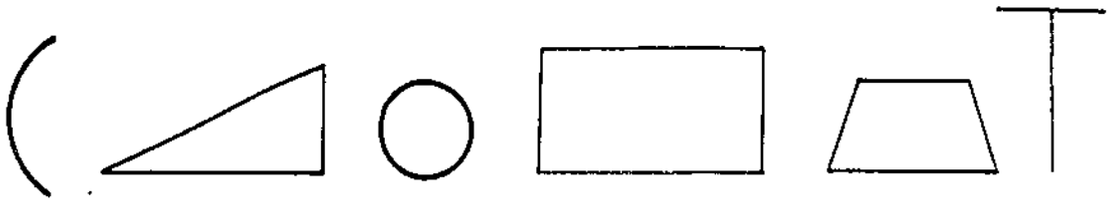
If you wish you may practice on this object.

Artistic quality is not important. Just try to use the given figures in as many different ways as possible.

You will be told when to begin work and when to stop work on each page. Work rapidly. No questions will be answered. Look again at the rules above.

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

PART I

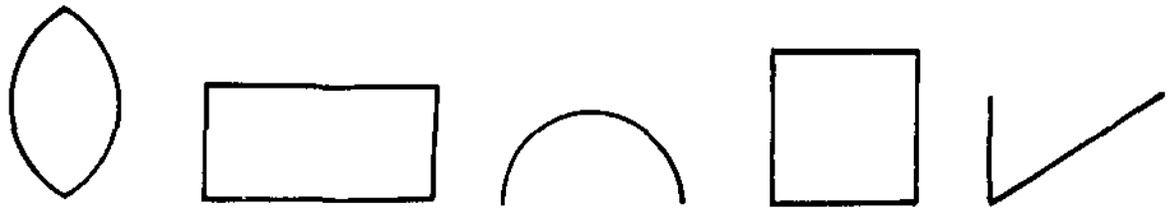


Use any or all of the given figures to make the named objects.

Sail Boat	Emu	Bicycle
Flower in Pot	Truck	Man Standing
Tree	Football	Dripping Tap

STOP HERE.

PART II



Use any or all of the given figures to make the named objects.

Purse	Candle	Car
Sunflower	Hat	Rabbit
House	Face	"Walkman" Tape Recorder

STOP HERE.

MATCH PROBLEMS

Form A

Raymond M. Berger and J. P. Guilford

NAME _____ SEX: M___ SCORES:
(Print) Last First Middle F___ Part I _____
Part II _____
GROUP _____ DATE _____ Total _____

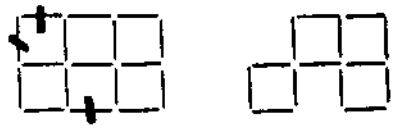
In this test you will see drawings of headless matches laid out in patterns. You are to remove some of the matches so that the ones left form new patterns.

Look at this example:

TAKE AWAY 3 MATCHES
LEAVING 4 SQUARES

Given

Solution A



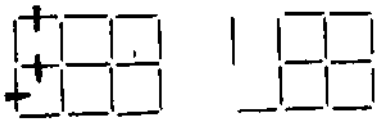
Your instructions for each item appear at the left. The drawing under "Given" presents the pattern of squares with which you start. To indicate a solution, mark through the matches you want removed. In the example, the solution marked would look like the pattern at the extreme right if the matches were actually removed. Note that only complete squares are left.

The attempt below is not an acceptable solution.

TAKE AWAY 3 MATCHES
LEAVING 4 SQUARES

Given

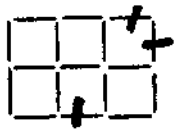
Wrong



This attempt is wrong because it leaves two matches that are not parts of the required four squares. You must remove matches so that exactly the required number of complete squares remain, with no matches left over.

In this test you will add to your score by giving additional different solutions to each problem. Here are some other possible ways of doing the same problem.

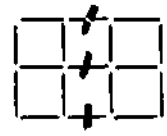
B



C

Notice that B and C use the same rule as solution A in the first example—two matches from a corner and the middle match from the opposite side. In getting really different solutions you apply different rules. Here B and C would not be counted.

D



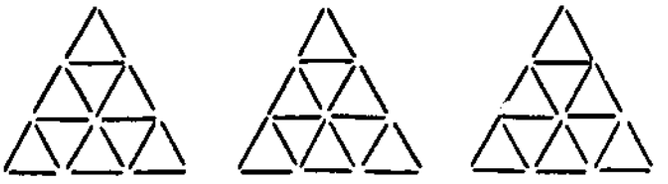
D uses a rule different from that in A, and also meets the instruction that all matches remaining are parts of remaining squares, so D is counted as a second acceptable solution.

GO TO THE NEXT PAGE FOR FURTHER INSTRUCTIONS.

(Instructions continued)

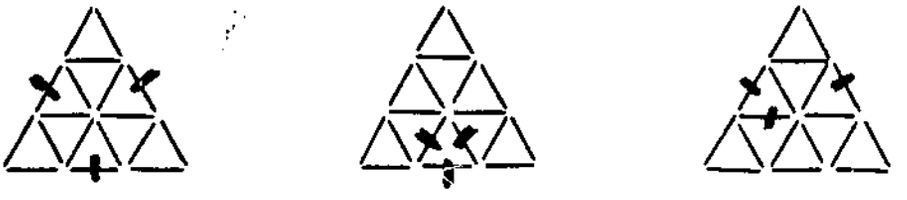
Here is another problem, this time using triangles. Try to find three different solutions.

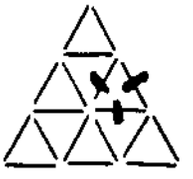
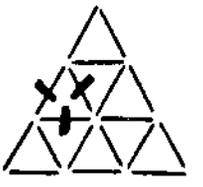
TAKE AWAY 3 MATCHES
LEAVING 6 TRIANGLES



Three solutions are shown below. Notice especially that each solution is in some way a pattern different from the others. All the triangles are complete, no matches being left over.

E F G



Suppose you had given solution F and also  or 

You would not be given credit for either additional solution since the pattern is the same as for F. Patterns must be different in order to receive credit.

There are two parts to this test, with 5 problems in each part. You are to find different solutions to each problem.

You will be allowed 7 minutes per part. Work rapidly. If you have difficulty with one problem, go on to the others and return later if time permits. Use a pencil. If you wish to change a solution, erase completely the marks you want to remove.

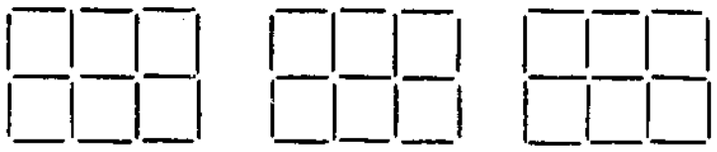
If you have questions, ask them now.

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

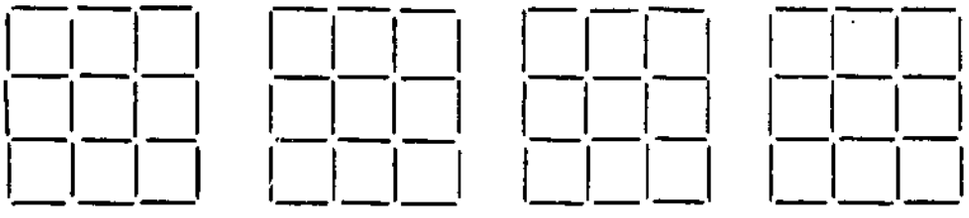
PART I

GIVE DIFFERENT SOLUTIONS FOR EACH PROBLEM.

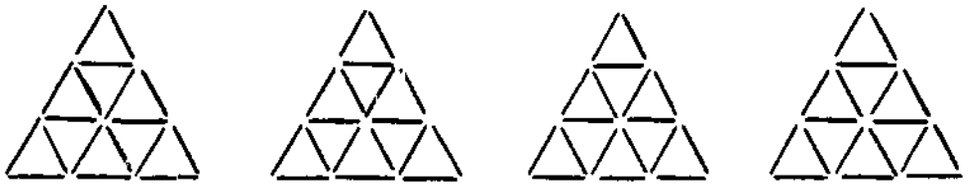
1. TAKE AWAY 7 MATCHES LEAVING 3 SQUARES



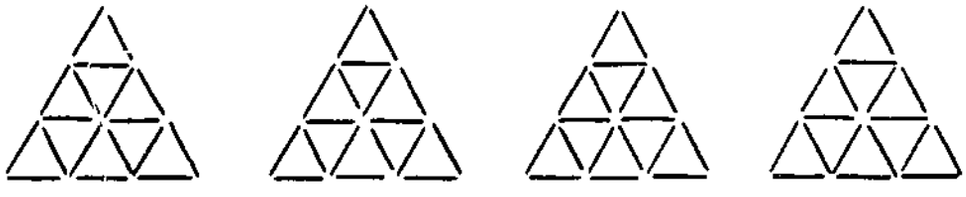
2. TAKE AWAY 6 MATCHES LEAVING 6 SQUARES



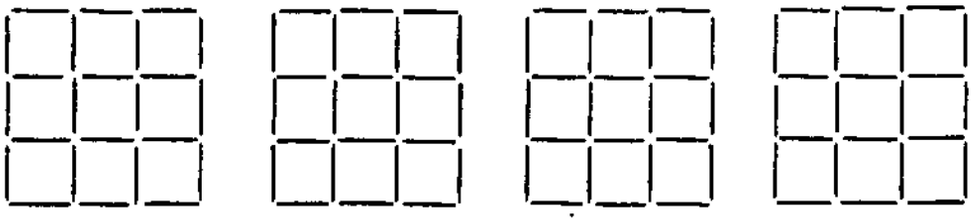
3. TAKE AWAY 5 MATCHES LEAVING 6 TRIANGLES



4. TAKE AWAY 7 MATCHES LEAVING 4 TRIANGLES



5. TAKE AWAY 8 MATCHES LEAVING 5 SQUARES

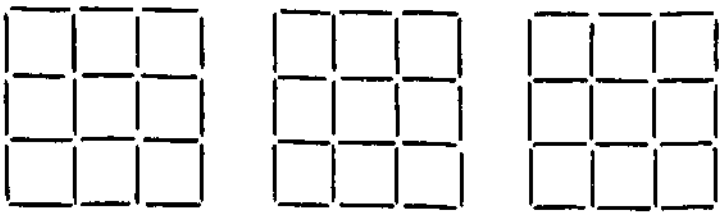


STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

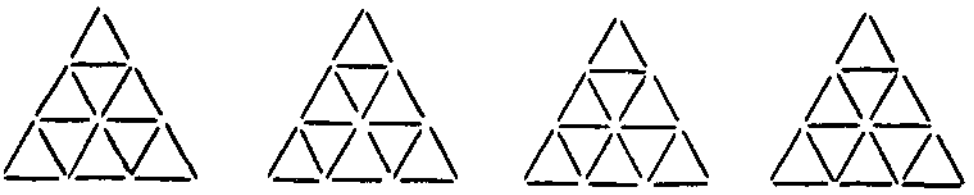
PART II

GIVE DIFFERENT SOLUTIONS FOR EACH PROBLEM.

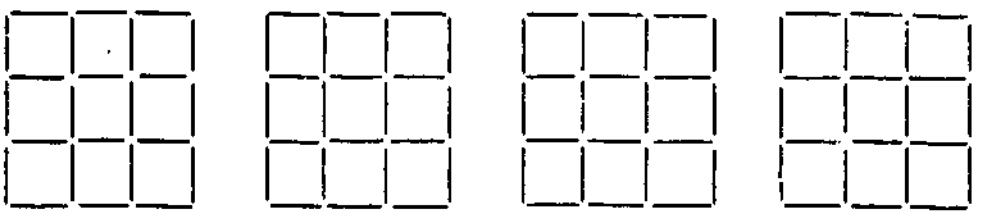
6. TAKE AWAY 4 MATCHES LEAVING 7 SQUARES



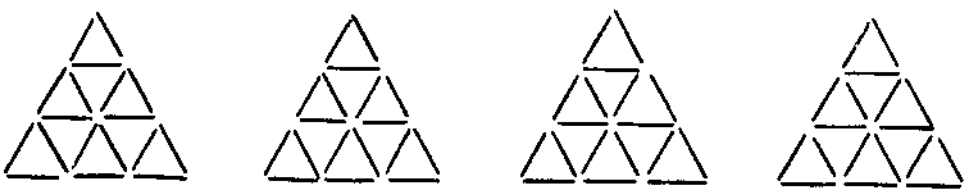
7. TAKE AWAY 6 MATCHES LEAVING 5 TRIANGLES



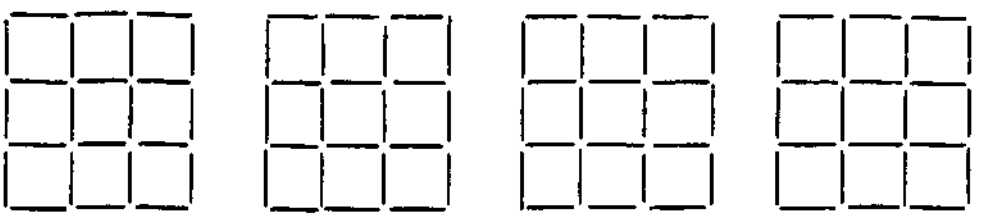
8. TAKE AWAY 5 MATCHES LEAVING 6 SQUARES



9. TAKE AWAY 8 MATCHES LEAVING 4 TRIANGLES



10. TAKE AWAY 7 MATCHES LEAVING 5 SQUARES



STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.